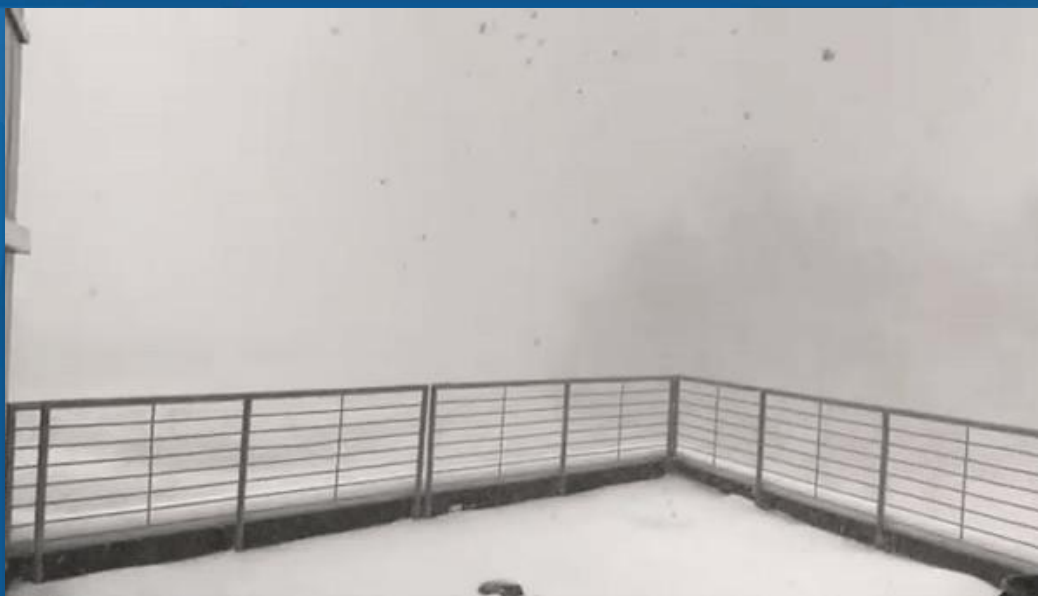




# Skywarn Weather Spotter Training

## 2019 – 2020 Autumn & Winter Sessions



*Frostbite & Hypothermia*

*Freezing Rain, Snow, Sleet*

*#FallSafety #WinterSafety*

*Turn Around Don't Drown*





# Outline

Skywarn Reporting Criteria

Weather Ready Nation

Facts about the NWS Albany County Warning Area (CWA)

Winter 2019-2020 outlook

Winter Weather events

Winter Weather forecasting criteria

Who, What, Where, When & How to Report to us

Conclusion



# Skywarn Spotter Information Sheet



NATIONAL WEATHER SERVICE, NOAA  
ALBANY, NY  
SKYWARN INFORMATION SHEET



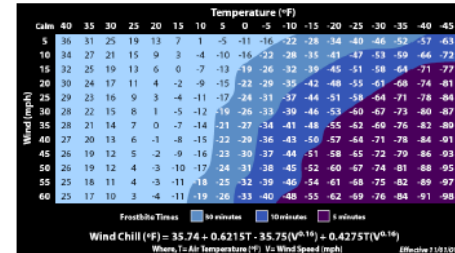
Report Severe Weather (Backup)	
Winter Weather Spotter Field Guide	<a href="https://www.weather.gov/media/safety/Winter_Storms2008.pdf">https://www.weather.gov/media/safety/Winter_Storms2008.pdf</a>
Email	<a href="mailto:alb.stormreport@noaa.gov">alb.stormreport@noaa.gov</a>
NWS Albany	<a href="http://www.weather.gov/Albany">www.weather.gov/Albany</a>
Twitter	<a href="https://twitter.com/NWSAlbany">@NWSAlbany</a>
Facebook Page	<a href="https://www.facebook.com/NWSAlbany">https://www.facebook.com/NWSAlbany</a>
NOAA Weather Radio	<a href="http://www.nws.noaa.gov/nwr">www.nws.noaa.gov/nwr</a>
Storm Prediction Center	<a href="http://www.spc.noaa.gov">www.spc.noaa.gov</a>
NWS Online Weather School	<a href="http://www.weather.gov/jetstream">www.weather.gov/jetstream</a>
Weather Prediction Center	<a href="http://wpc.ncep.noaa.gov">wpc.ncep.noaa.gov</a>
River Flood Monitoring	<a href="http://water.weather.gov/ahps">water.weather.gov/ahps</a>
CoCoRaHS	<a href="http://www.cocorahs.org">www.cocorahs.org</a>
NWS Amateur Radio Frequency	Primary 146.64 MHz - Secondary 145.19 MHz

## IMPORTANT WEATHER TO REPORT

When you report, please give your location (including your county) and the time of the observation. Try to report as soon as possible after observing the event and, *remember your safety comes first!* Please concentrate on the following phenomena:

<b>SNOWFALL</b>	After 1 inch of new snow, measurements every 6-hours and then final storm total at the conclusion of the event. In addition, note and report when precipitation type changes.
<b>FREEZING RAIN</b>	As soon as you observe the occurrence of freezing rain or freezing drizzle, especially if it starts to collect on objects. Call again if the ice accumulation exceeds 1/4 inch. (measure on flat surface)
<b>THUNDER SNOW</b>	Location and time of occurrence
<b>WIND SPEEDS</b>	Report wind speeds greater than 40 mph
<b>RAINFALL</b>	Report when you receive one inch (and then at least every inch thereafter)
<b>FUNNEL CLOUD</b>	A "rotating" appendage descending from the base of a cumulonimbus cloud, but not touching the ground. If possible, always look at the area beneath the funnel cloud for flying debris. If flying debris is observed, it is a tornado.
<b>TORNADO</b>	Violently rotating column of air descending from a cumulonimbus cloud and touching the ground. Look for flying debris. If possible, report any injuries or fatalities
<b>HAIL</b>	Report hail 0.75 or larger. Specify the diameter based on the hail scale.
<b>FLOODING</b>	Any flooding including streams out of their banks, water over road, water in basement or any ice jam flooding. Report deepest water depth (estimate if necessary).
<b>DAMAGE</b>	Report all storm-related damage (large branches, fallen trees, structural damage, flood damage, etc.) Even if it is several days after the event.

## TIME TO FROSTBITE



## ESTIMATED WIND SCALE

25-31 MPH	Large branches in motion; whistling in telephone wires
32-38 MPH	Entire trees in motion; slight difficulty walking against wind
39-54 MPH	Twigs break off trees; wind generally impedes progress
55-72 MPH	Damage to chimneys and TV antenna; large limbs/branches down
73-112 MPH	Roof surfaces damaged; windows broken; light mobile homes moved or overturned; moving vehicles pushed off road
113-157 MPH	Roofs torn off; weak buildings and mobile homes destroyed
≥158 MPH	Severe damage; cars lifted completely off ground

## DEFINITIONS

<b>Hazardous Weather Outlook</b>	Hazardous winter weather conditions are possible in the next 2-5 days. Stay tuned to local media and NOAA Weather Radio All Hazards for updates.
<b>Watch</b>	Hazardous impact conditions are possible within the next 36-48 hours. Prepare now!
<b>Warning</b>	Life-threatening impact conditions have begun or will begin within 24 hours. Act Now!
<b>Advisory</b>	These events will be an inconvenience. However, if caution is not exercised, it could become life-threatening.
<b>Flooding</b>	Flooding typically occurs when prolonged rain falls over several days, when intense rain falls over a short period of time, or when an ice or debris jam causes a river or stream to overflow onto the surrounding area. Flooding can also result from the failure of a water levee or dam, as well. The most common cause of flooding is water due to rain and/or snowmelt that accumulates faster than soils can absorb it or rivers can carry it away. Flash floods generally develop within 6 hours of the immediate cause and exhibit a rapid rise of water over low-lying areas.
<b>Ice Jam</b>	Pieces of floating ice carried with a stream's current that accumulate and block the movement of water. The water that is held back may cause flooding or flash flooding upstream. If the jam suddenly breaks then flash flooding may occur downstream.
<b>Funnel Cloud</b>	Cold air funnels form beneath showers or weak thunderstorms when the air aloft is especially cold. They are much less violent than other types of tornadoes.
<b>Downburst</b>	A strong downdraft with an outrush of damaging wind on or near the ground Macroburst – swath of damaging wind more than 2.5 miles wide Microburst – swath of damaging wind 2.5 miles or less



# Weather-Ready Nation

A network of external organizations working with NOAA.

The network of committed partners to carry out the goal of WRN include (but not limited to):

- ***Government Agencies***
- ***Private Sector***
- ***Emergency Managers***
- ***Researchers***
- ***Media***
- ***SKYWARN Spotters***
- ***YOU!***



The purpose of the Weather-Ready Nation initiative is to save more lives and livelihoods. By increasing the nation's weather-readiness, the country will be prepared to protect, mitigate, respond to and recover from weather-related disasters.



# Winter Weather Safety

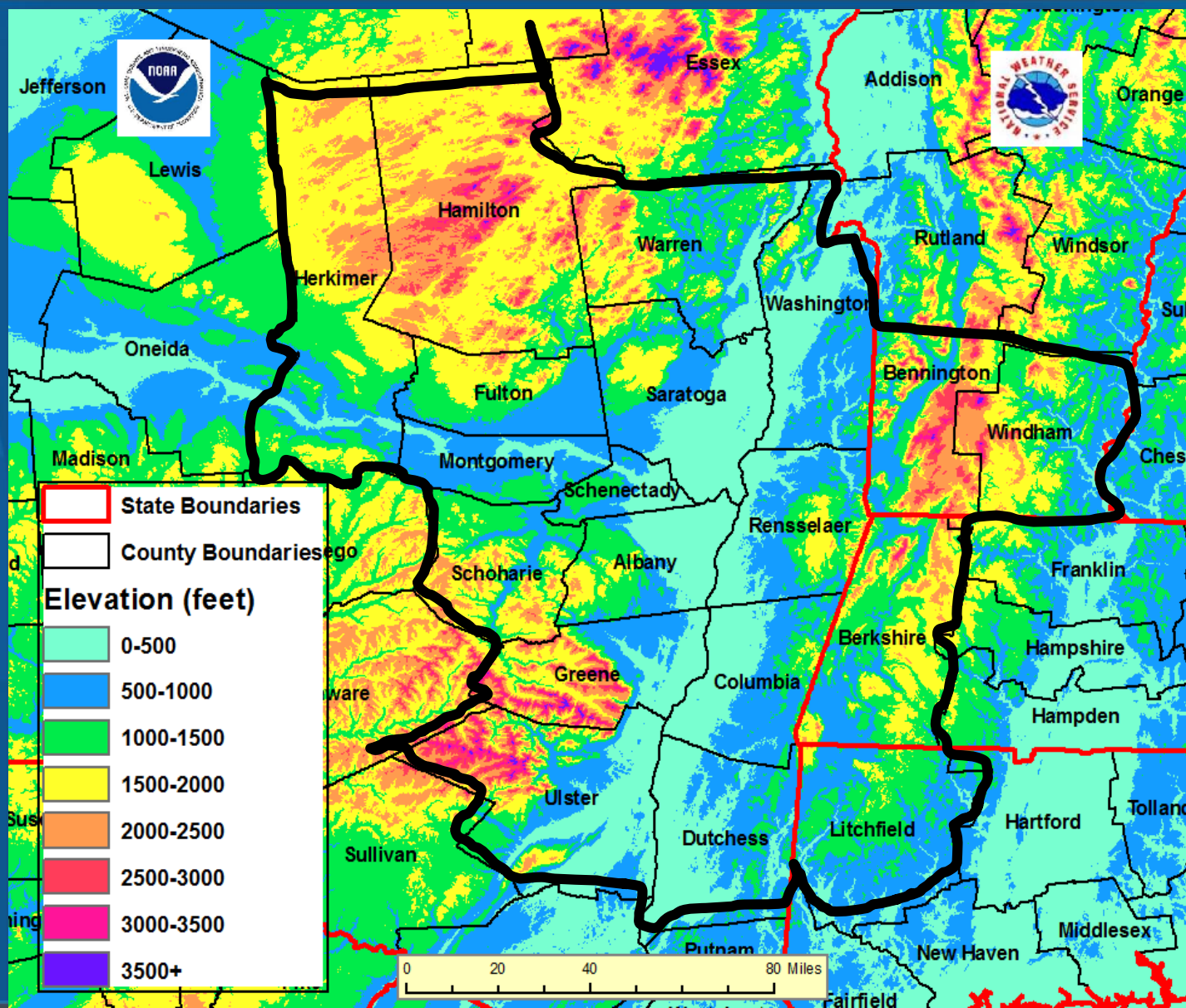
**W**ear warm clothing  
**I**ce (Don't slip and fall)  
**N**o reports, unless its safe  
**T**ravel only when necessary  
**E**mergency kit  
**R**adio (NOAA Weather  
Radio All Hazards)



**Your Safety is ALWAYS #1**



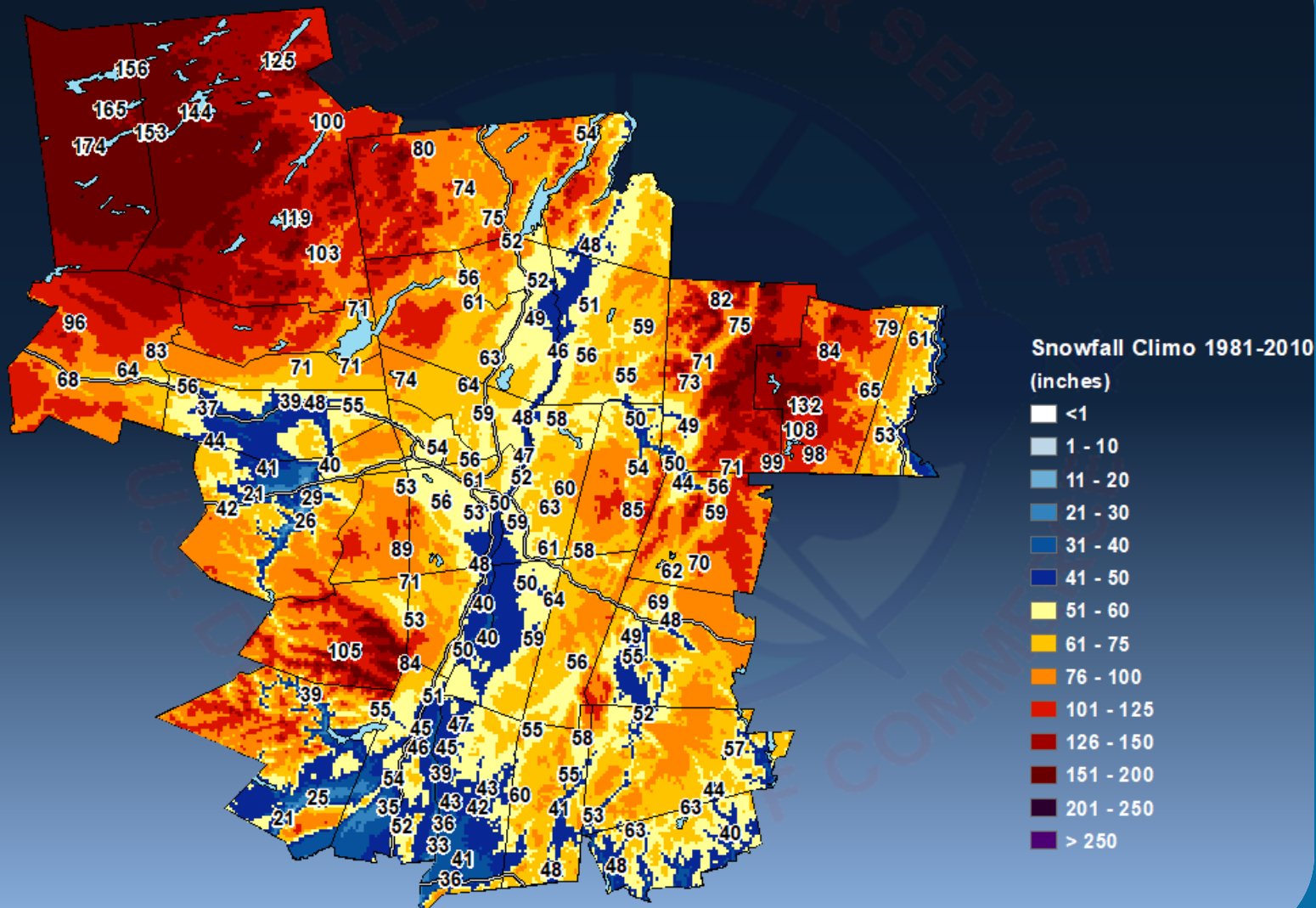
# Local Topography – Albany Forecast Area





# Snowfall Climatology – Albany Forecast Area

## Seasonal Snowfall Climatology 1981-2010



This is an experimental product. Care should be taken in using the data. Unofficial observations are plotted. Values at interpolated locations may not represent actual precipitation totals at that location.



# Winter Outlook

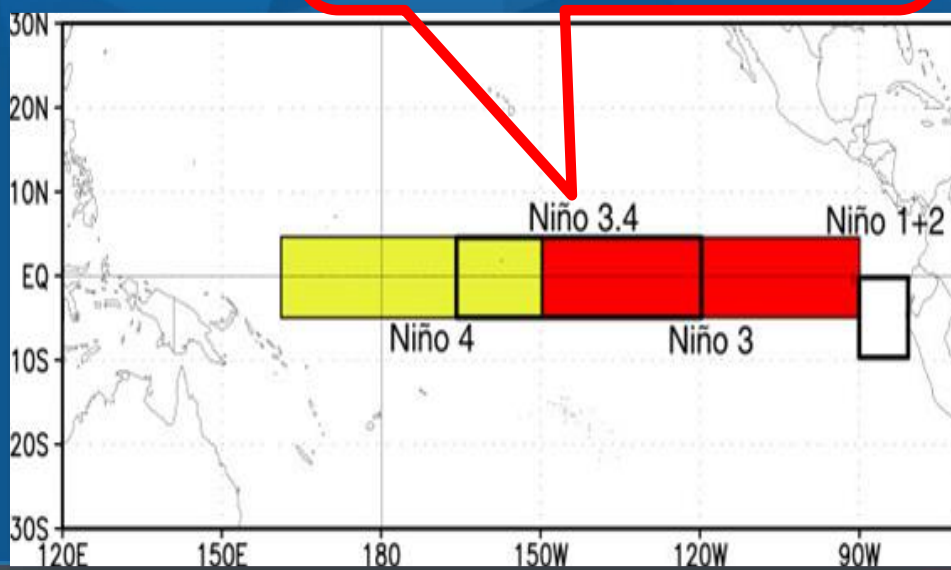


# El Niño/La Niña

What is El Niño?? → This is when sea surface temperature anomalies (values that are not at average) are positive...or above normal of a value of 0.5 C or higher in the Niño 3.4 Region for at least one month in-conjunction with other long term criteria's.

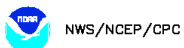
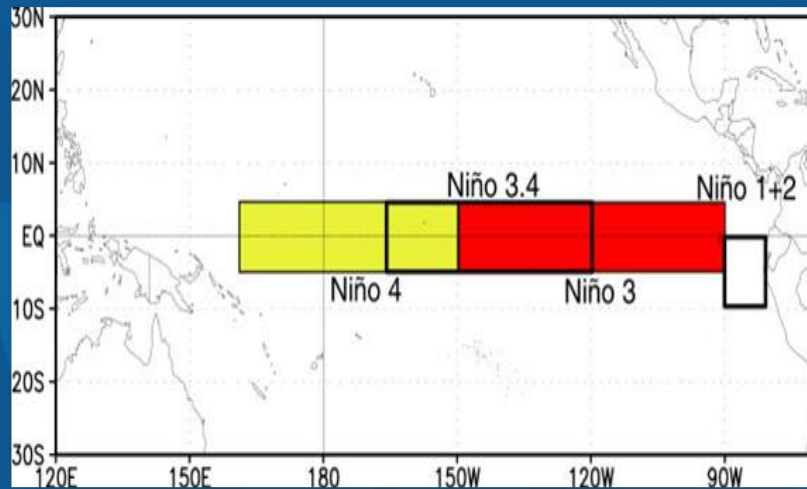
What is La Niña?? → This is when sea surface temperature anomalies are negative...or below normal of a value of -0.5 C or lower in the Niño 3.4 Region for at least one month in-conjunction with other long term criteria's.

The domain of the Niño 3.4 region lies between 5°S-5°N and 120°W-170°W



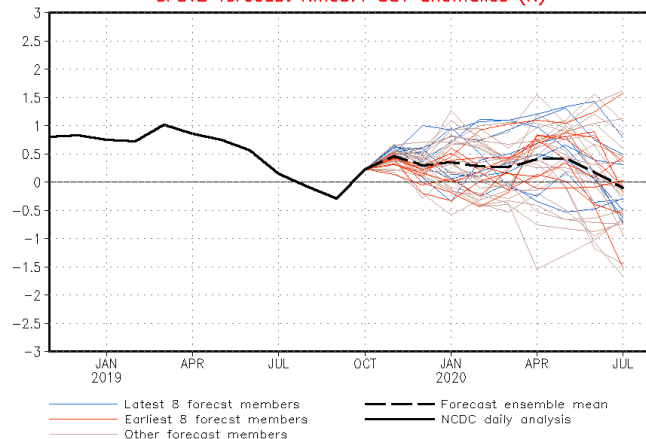


# Pacific Ocean Data

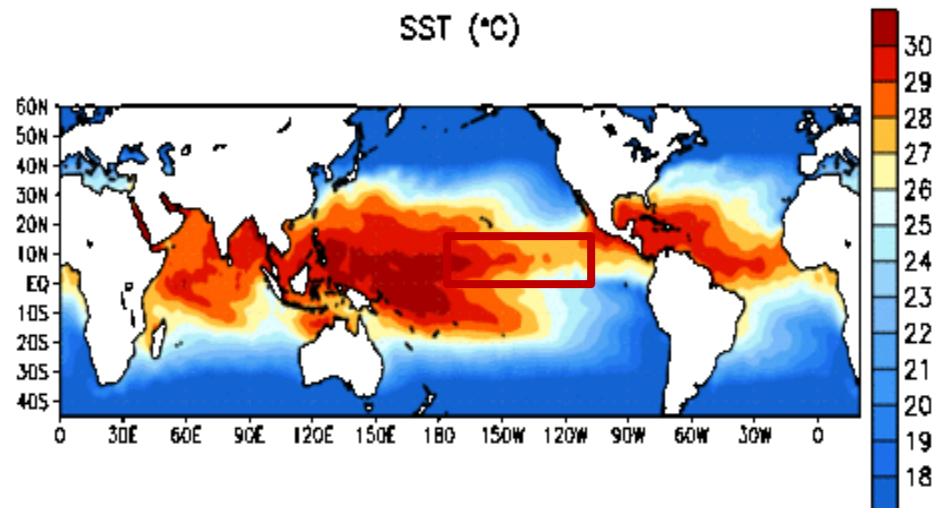


Last update: Tue Oct 22, 2019  
Initial conditions: 11Oct2019-20Oct2019

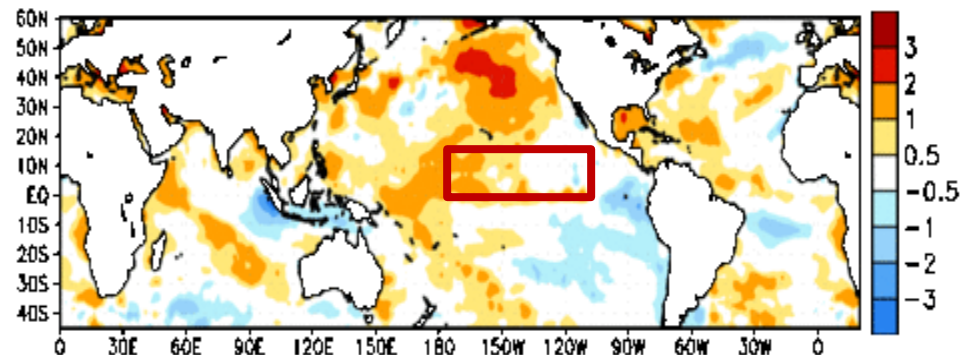
CFSv2 forecast Nino3.4 SST anomalies (K)



Week centered on 23 OCT 2019  
SST ( $^{\circ}\text{C}$ )



Anomalies ( $^{\circ}\text{C}$ )





# 2019-2020 Winter Outlook

## Probability Forecast

**Temperatures** -> *warmer than normal*

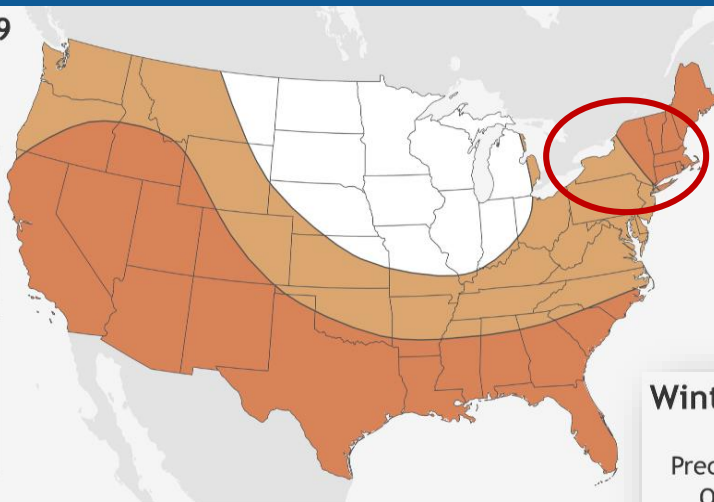
**Precipitation** -> *equal chances/slightly above*

### Winter 2019

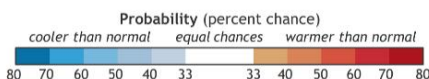
U.S.  
Temperature  
Outlook



AK and HI not to scale



Temperature Outlook  
for December 2019 – February 2020  
Issued 17 October 2019



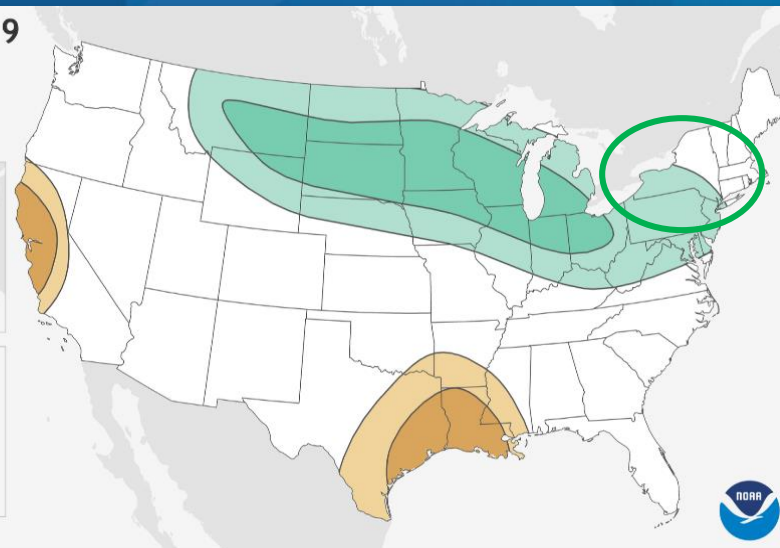
NWS Climate Prediction  
Map by NOAA

### Winter 2019

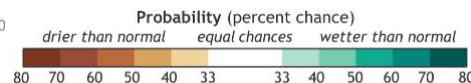
U.S.  
Precipitation  
Outlook



AK and HI not to scale



Precipitation Outlook  
for December 2019 – February 2020  
Issued 17 October 2019



NWS Climate Prediction Center  
Map by NOAA Climate.gov



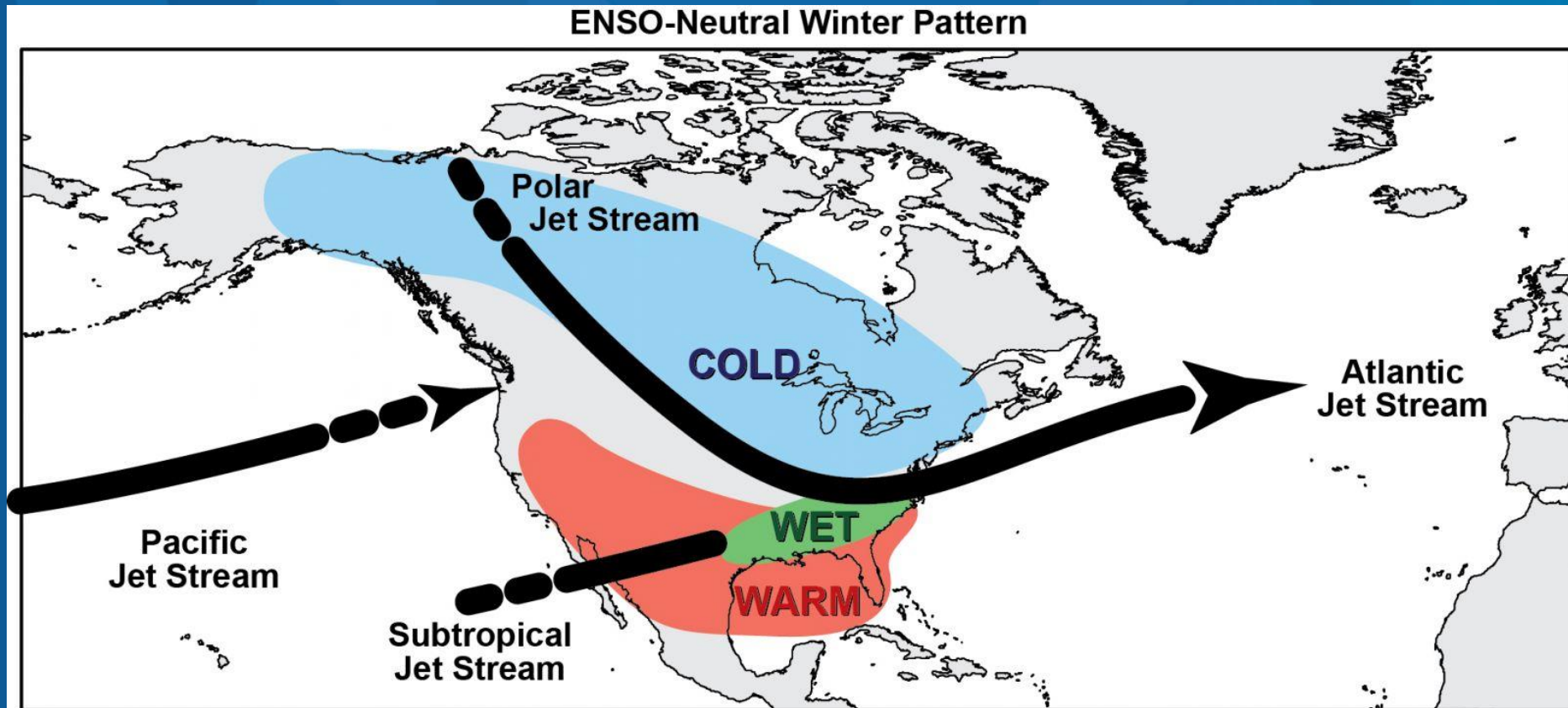
**DJF = December – January – February**



## Winter 2019-2020 Outlook...What do those graphics mean for us?

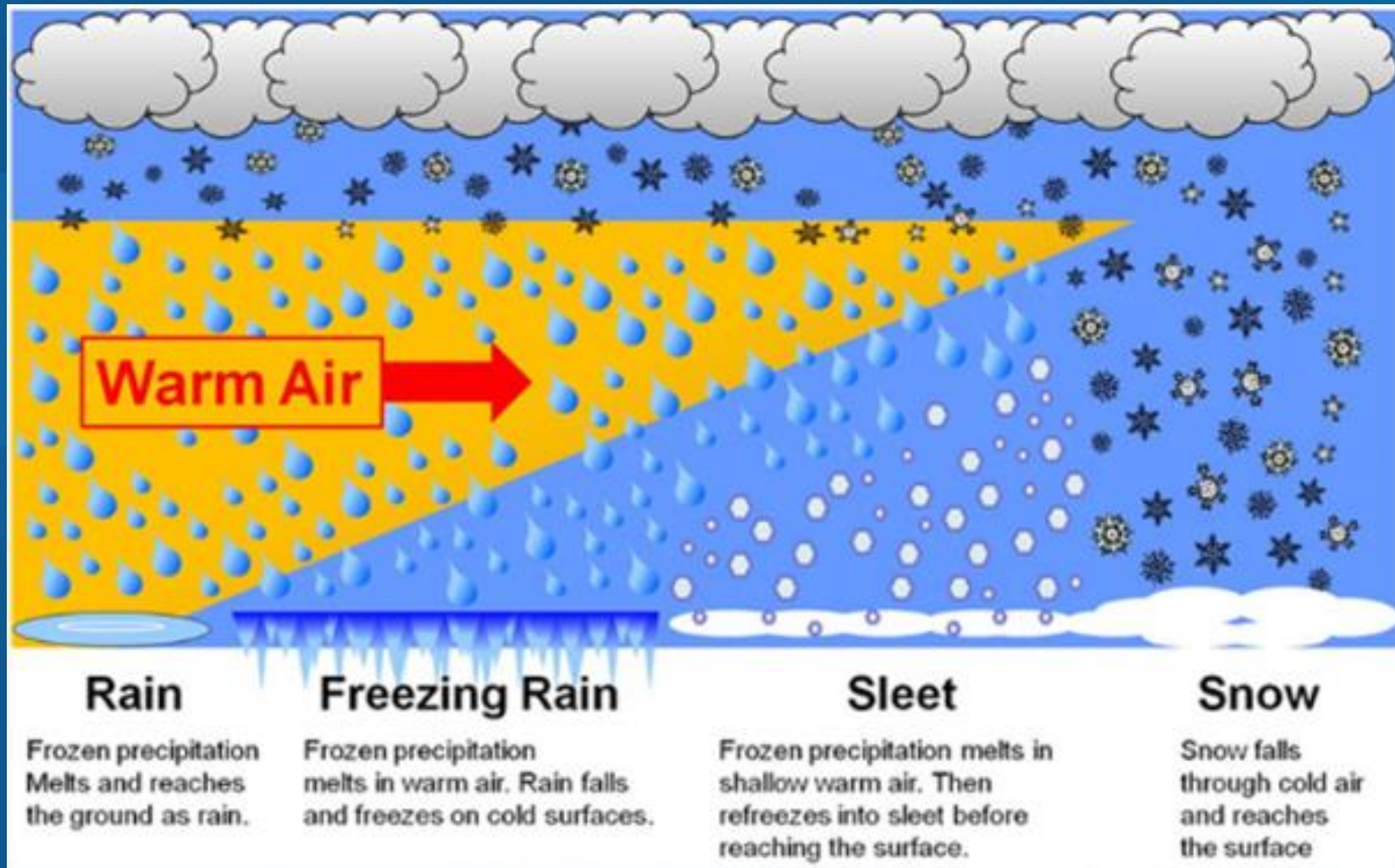
ENSO-neutral conditions are present.

ENSO-neutral is favored during the Northern Hemisphere fall 2019 (~75% chance), continuing through spring 2020 (55-60% chance).





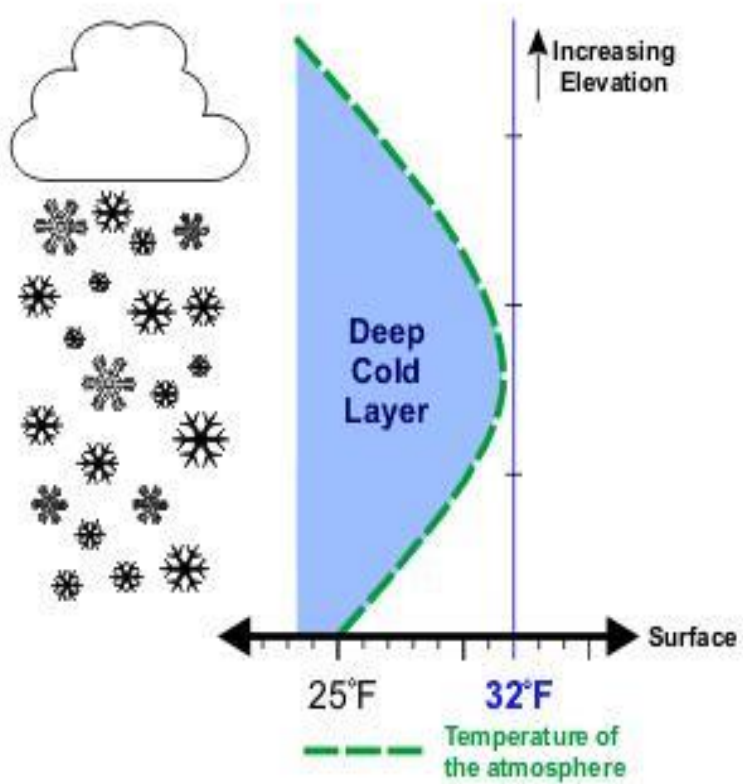
# Winter Precipitation Types



We launch weather balloons at least twice a day  
from our forecast office!

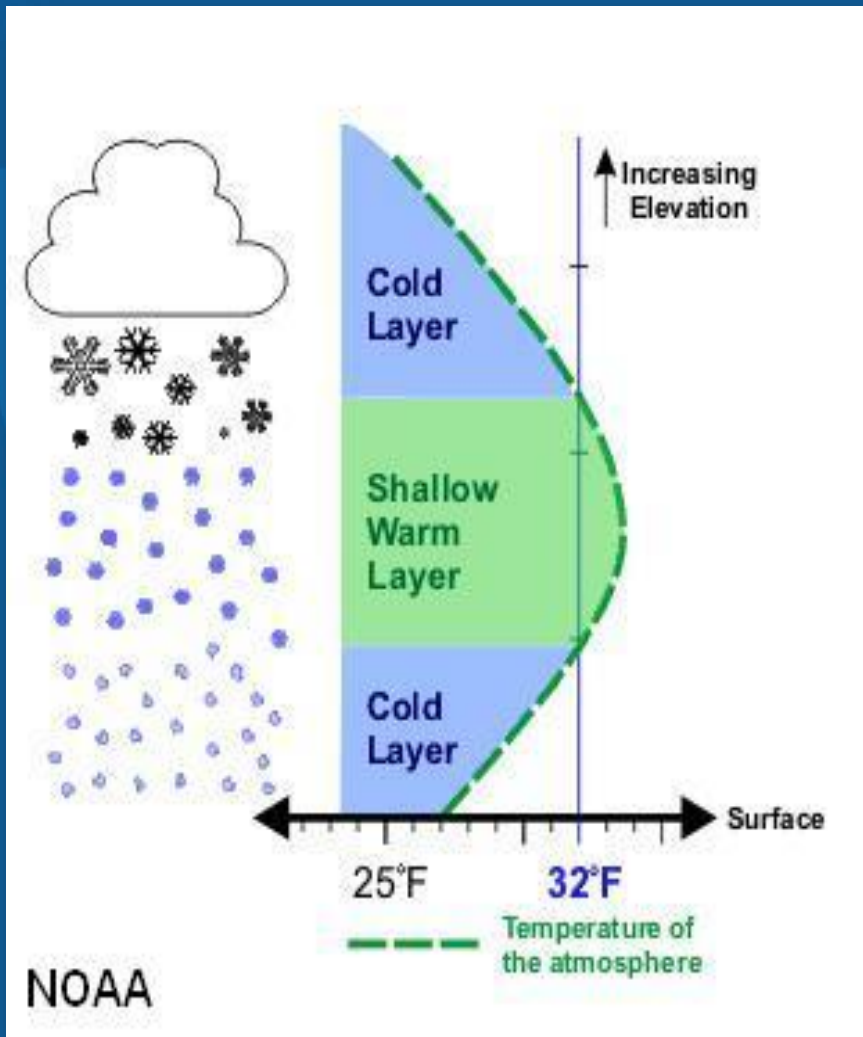


# SNOW



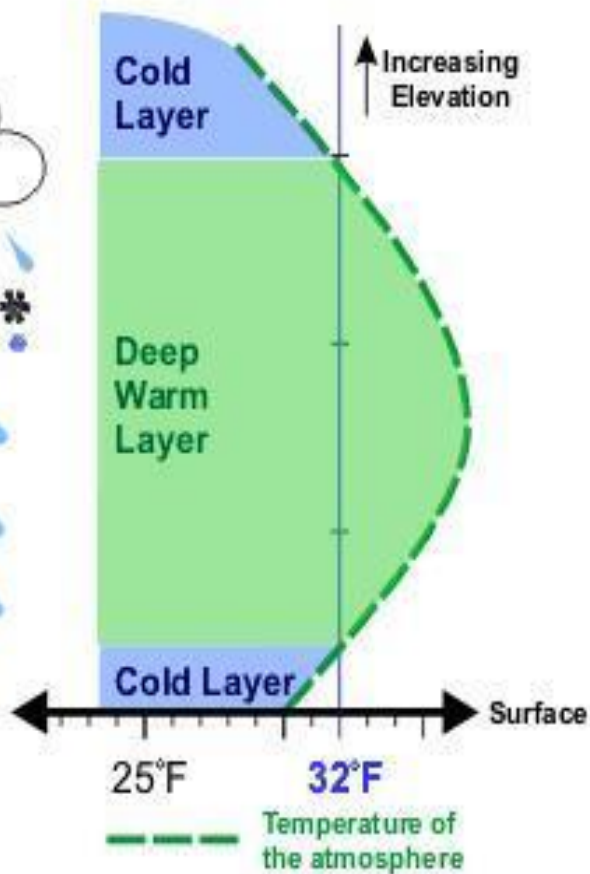


# Sleet





# Freezing Rain



NOAA



Photo, Ingrid Amberger, NWS Albany, NY



# Snowfall Measurement Review

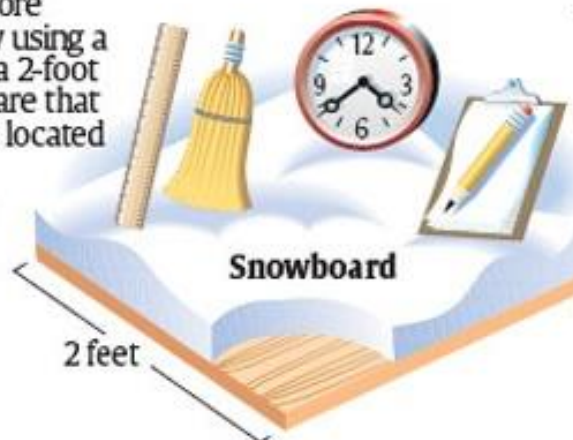
## How to measure snow

You don't need a degree in meteorology to measure snow, just some basic equipment and a keen eye for observation. Snow reports from volunteer weather observers provide important data each day about snow cover as well as new snowfall.

**1** Daily measurement of snow cover can be made by picking an open location away from pavement, buildings and trees. Push a ruler all the way to the ground and read the depth of the snow.



**2** New snowfall can be measured more accurately by using a snowboard, a 2-foot wooden square that can easily be located during the snowstorm.



**3** Frequent measurement is encouraged, clearing the snow no more than once every six hours.

**4** When the snow stops falling, add up your measurements to come up with the total for the event.

Sources: *The Snow Booklet* by Nolan J. Doesken and Arthur Judson; National Weather Service

By Bob Swanson and Karl Gelles, USA TODAY

Snowfall Measurements are rounded to nearest 0.1"



# Snowfall & Water Equivalent Measurement Review

## First Step



## Second Step



## Last Step



# Types of Snow Storms





# 1. Overrunning

1

## Near the ground

Warm air flows north heading for dome of cold air at surface.

2

## Up and over

Lighter warm air is forced upward when it plows into cold, dense air.

3

## Precipitation

Rising warm air cools, forming low-topped clouds and steady rain, snow.



(Source: USA Today)



# 2. Alberta Clipper

**1**

## **Birth of a storm**

Area of low pressure often forms east of mountains in Alberta, Canada.

**2**

## **Air movements**

Cold outbreak reinforced behind storm as it moves across USA.



(Source: USA Today)



# 3. Nor'easters

1

## The beginning:

Weak area of low pressure forms near the East Coast.



2

## Winding up:

Warm, moist air surges west from Atlantic, cold air drops south as storm rapidly intensifies.



3

## The fury:

Heavy rain, snow along with coastal flooding and strong northeast winds batter East.





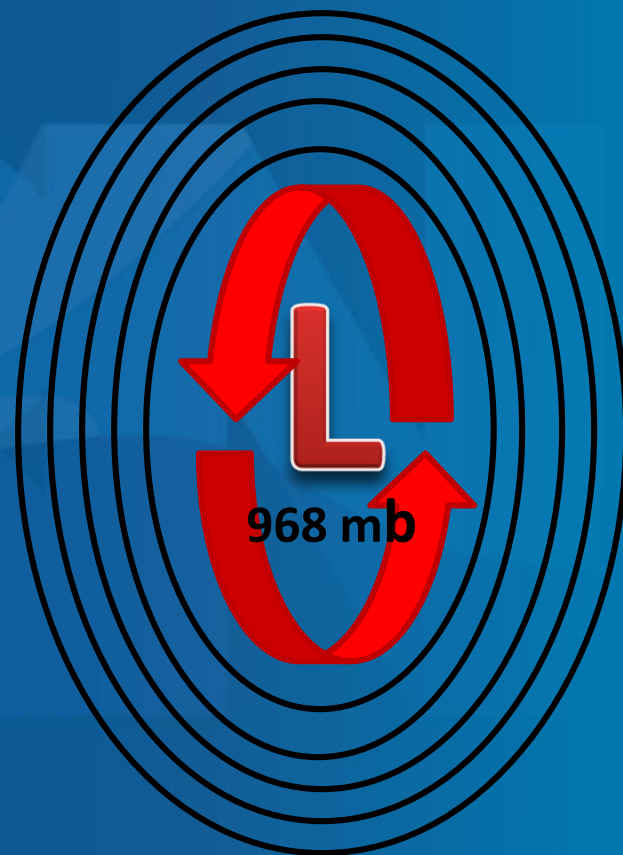
# Bomb Cyclone (or Bombogenesis)

8 PM Wednesday



24 Hours Later...

8 PM Thursday



***Bomb Cyclone:*** When the central pressure of a low pressure system decreases by at least 24 millibars (mb) in 24 hours



# A Blizzard is...

When the following conditions persist for *at least* 3 hours...

- ✓ Sustained or gusty winds of 35 MPH or more.
- ✓ Falling **or** Blowing snow reduce visibilities to or below  $\frac{1}{4}$  of a mile.

Note: Blizzard conditions can occur before, during or after a major snowfall event and Snow DOES NOT have to be falling to meet blizzard criteria.



# 4. Lake Effect

1

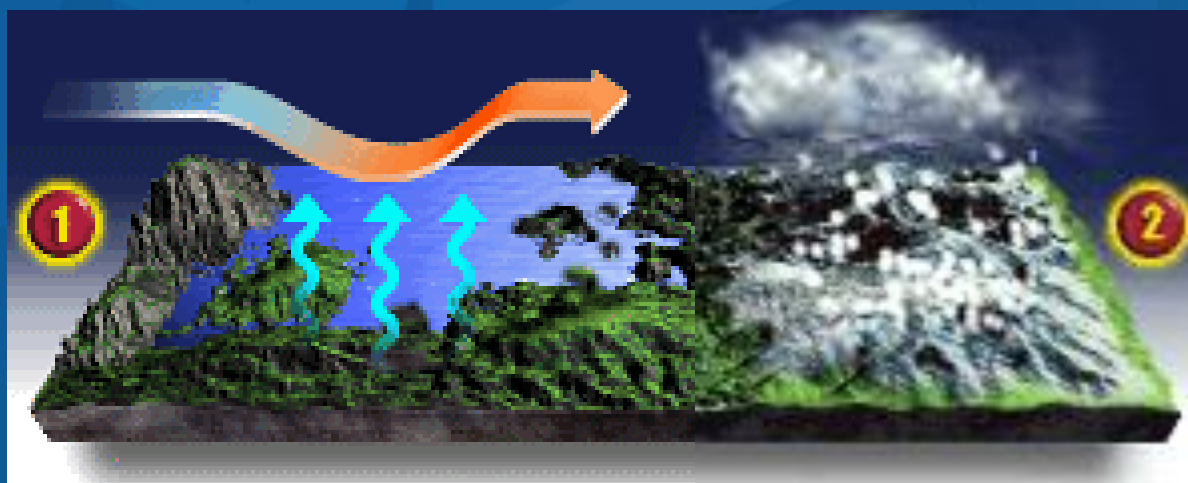
## **Cold outbreak**

Frigid air flows over warm water and is warmed from below. Moisture evaporates into the air.

2

## **Heavy snow**

Warmer, more moist air rises downwind of lakes and often forms heavy snow squalls.

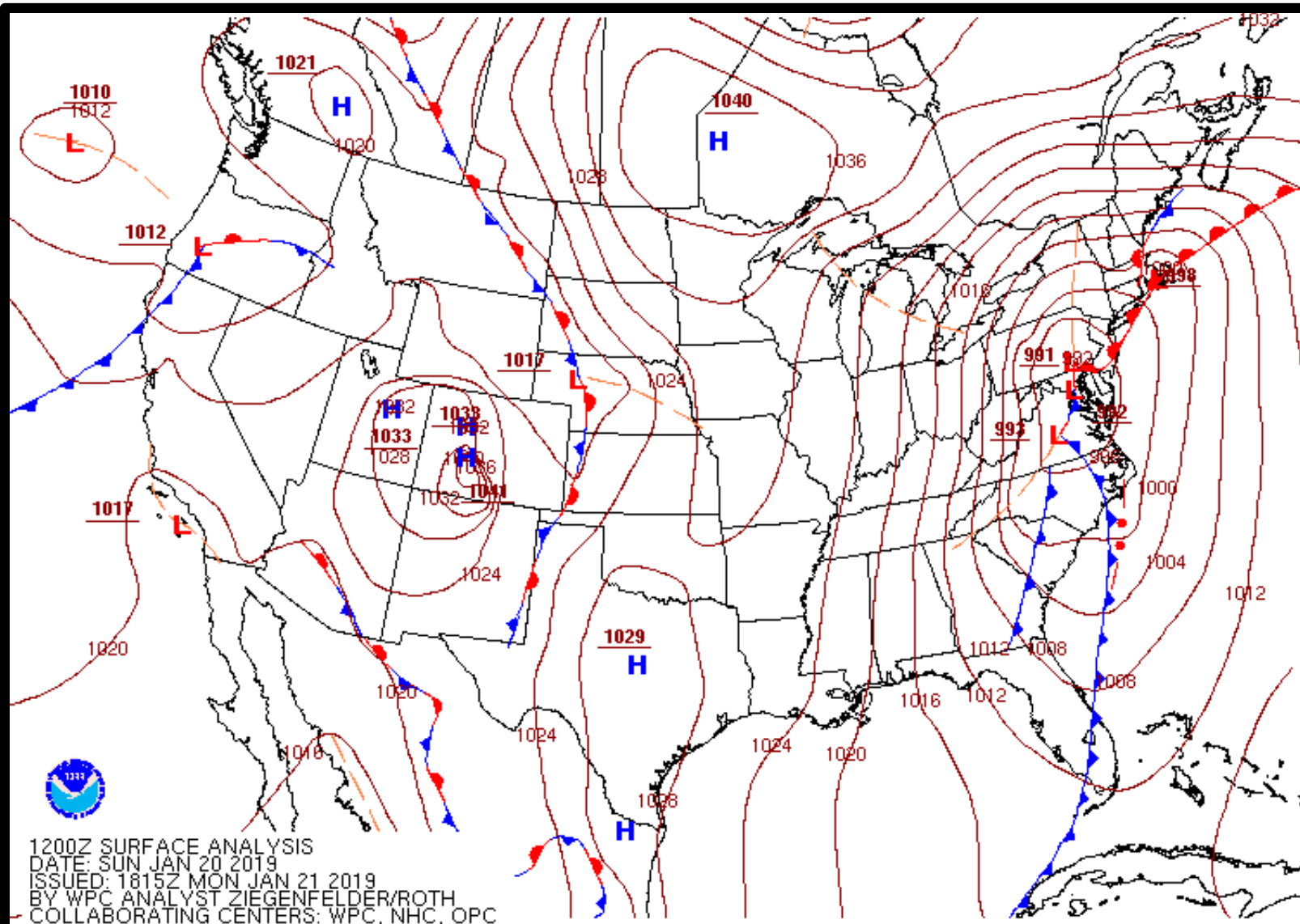




# Recent Notable Events



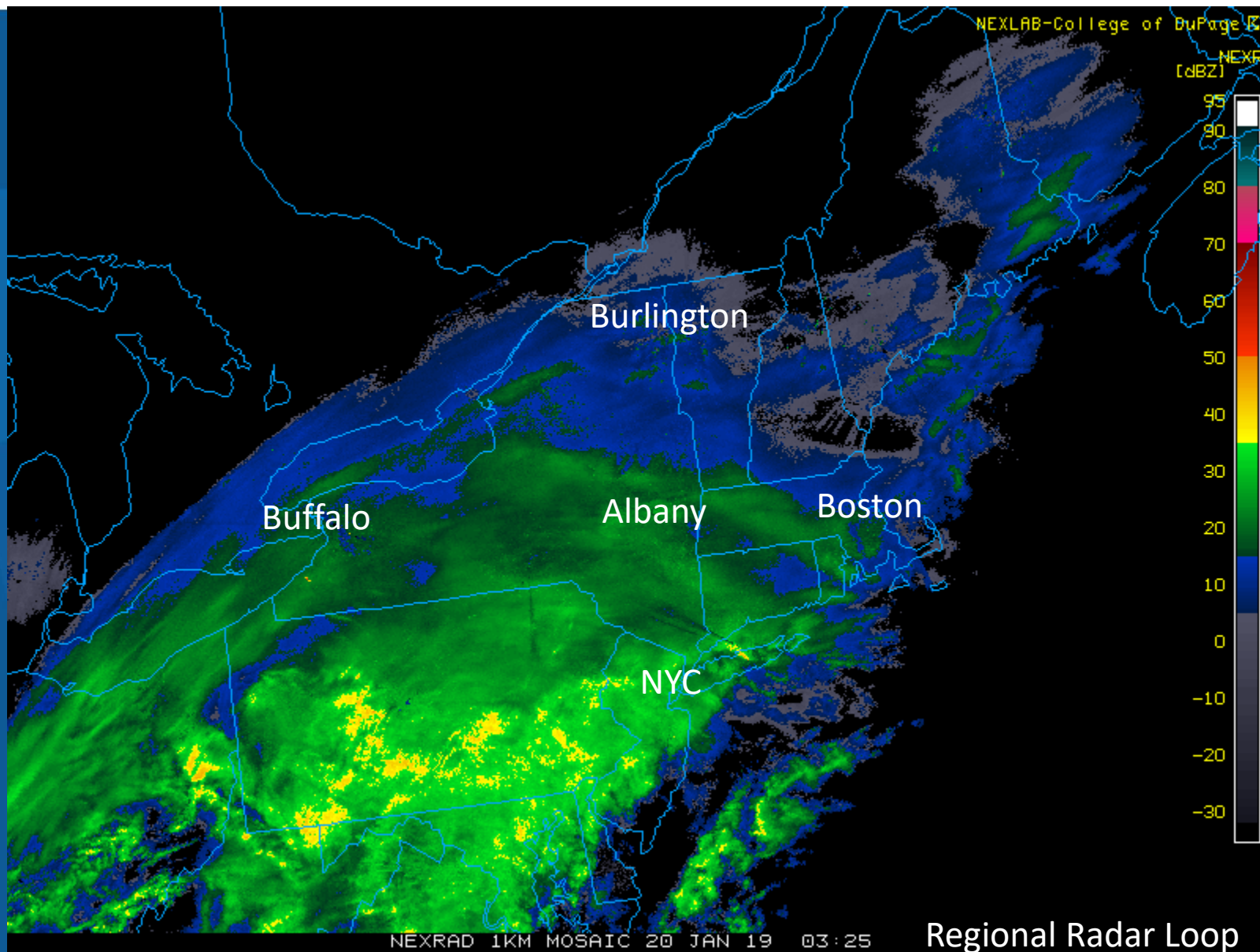
# Surface Map 700 AM 1/20/2019



1200Z SURFACE ANALYSIS  
DATE: SUN JAN 20 2019  
ISSUED: 1815Z MON JAN 21 2019  
BY WPC ANALYST ZIEGENFELDER/ROTH  
COLLABORATING CENTERS: WPC, NHC, OPC



# January 20, 2019 Snow Bands



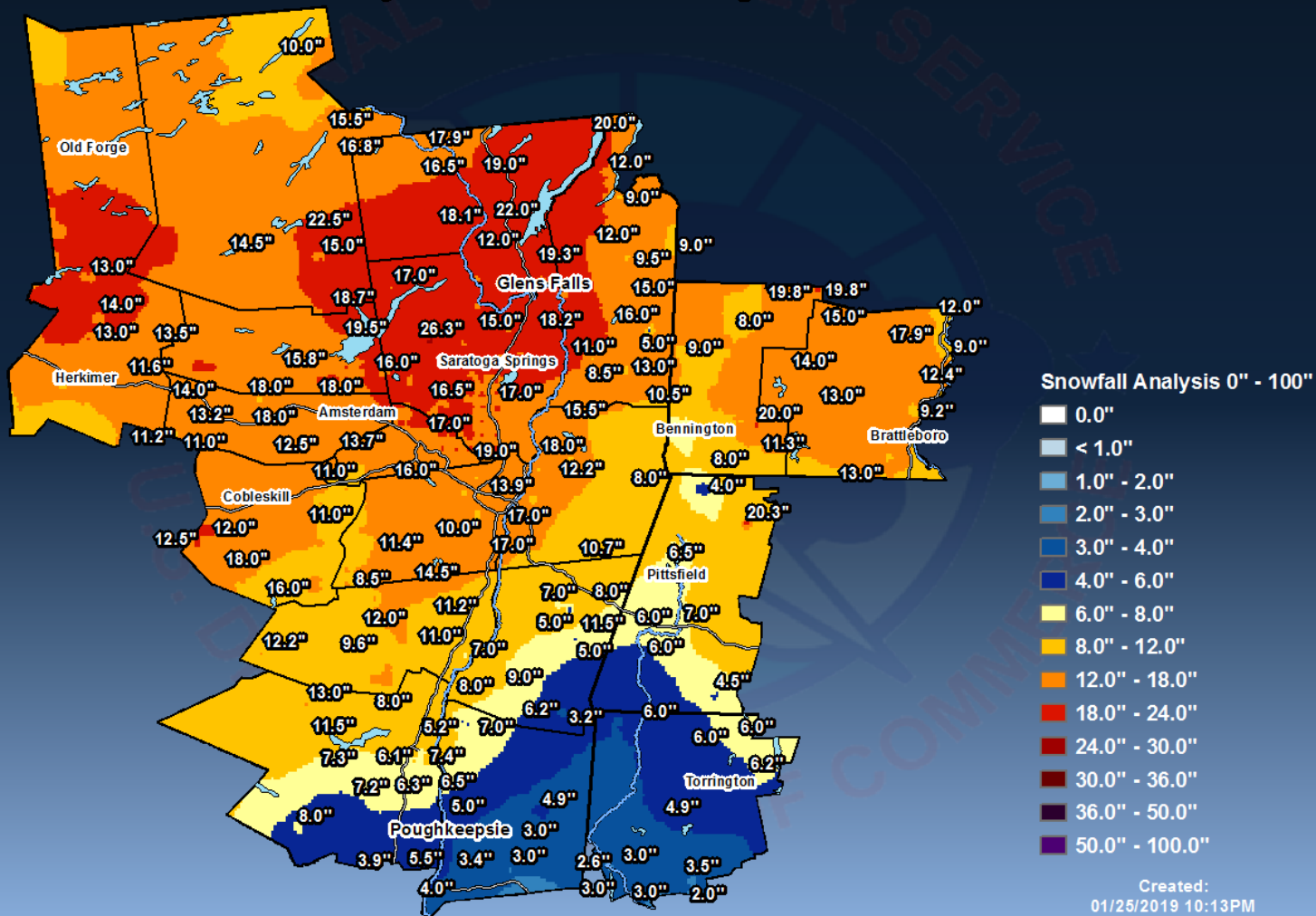


# JAN 19-20, 2019 Snowstorm

## National Weather Service Albany New York

January 19 - 20, 2019 Winter Storm

Analysis Data Source: NOHRSC and Regional Observations



This is an experimental product. Care should be taken in using the data. Unofficial observations are plotted. Values at interpolated locations may not represent actual precipitation totals at that location.

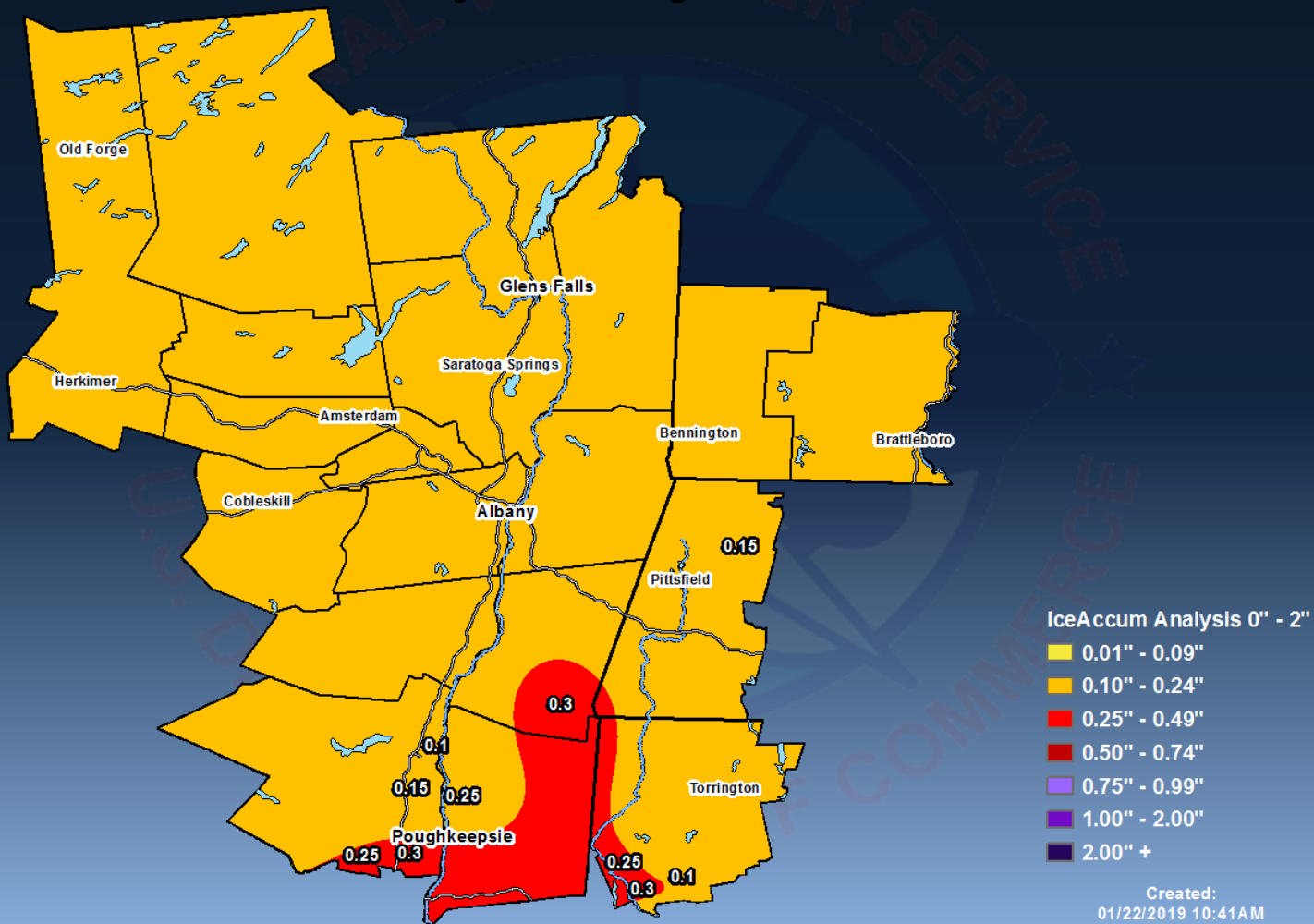


# JAN 19-20, 2019 Ice Accumulation

## National Weather Service Albany New York

January 19 - 20, 2019 Winter Storm

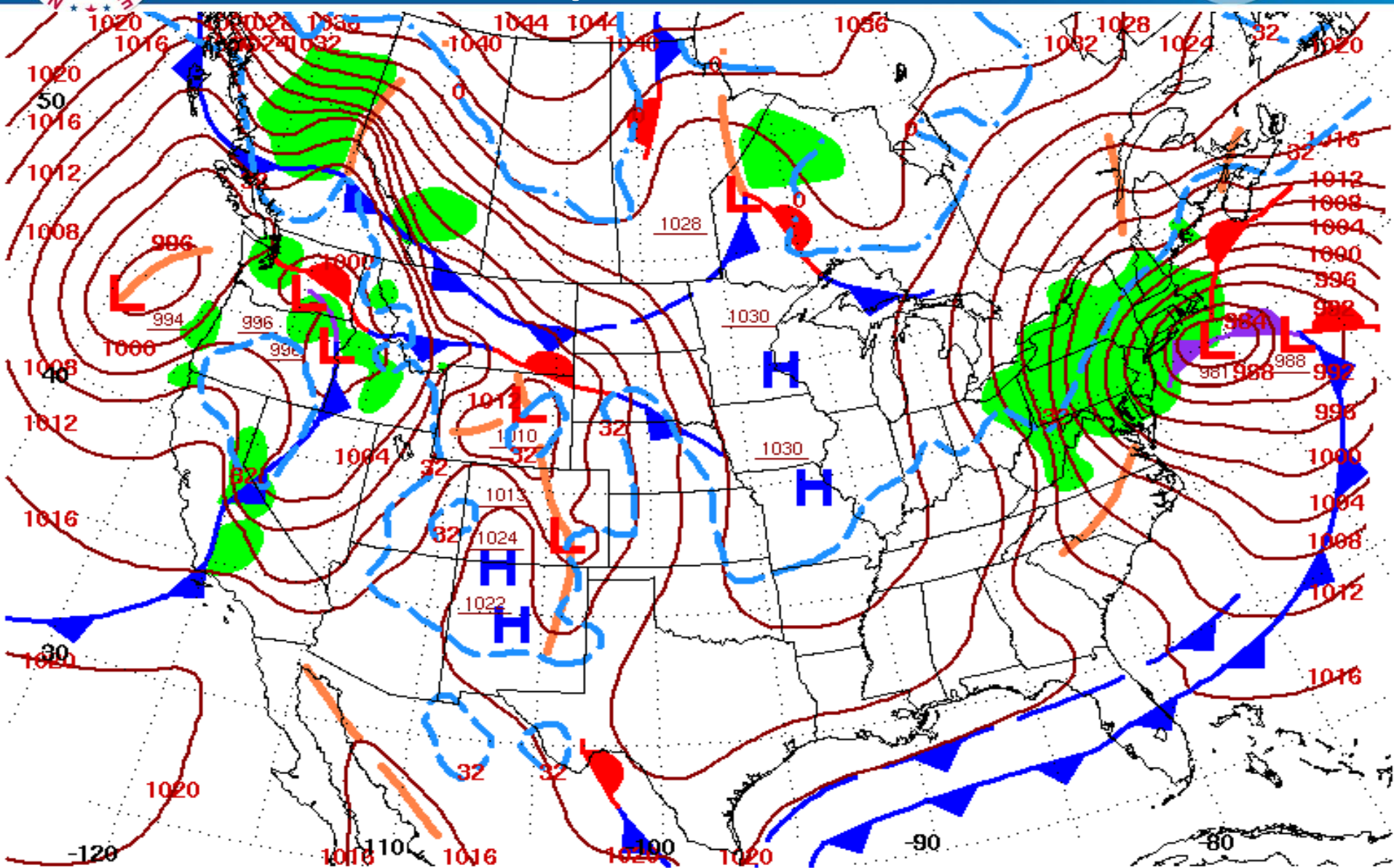
Analysis Data Source: Regional Observations



This is an experimental product. Care should be taken in using the data. Unofficial observations are plotted. Values at interpolated locations may not represent actual precipitation totals at that location.



# Surface Map 700 AM 3/2/2018



Surface Weather Map at 7:00 A.M. E.S.T.



# Middleburgh, NY March 2, 2018



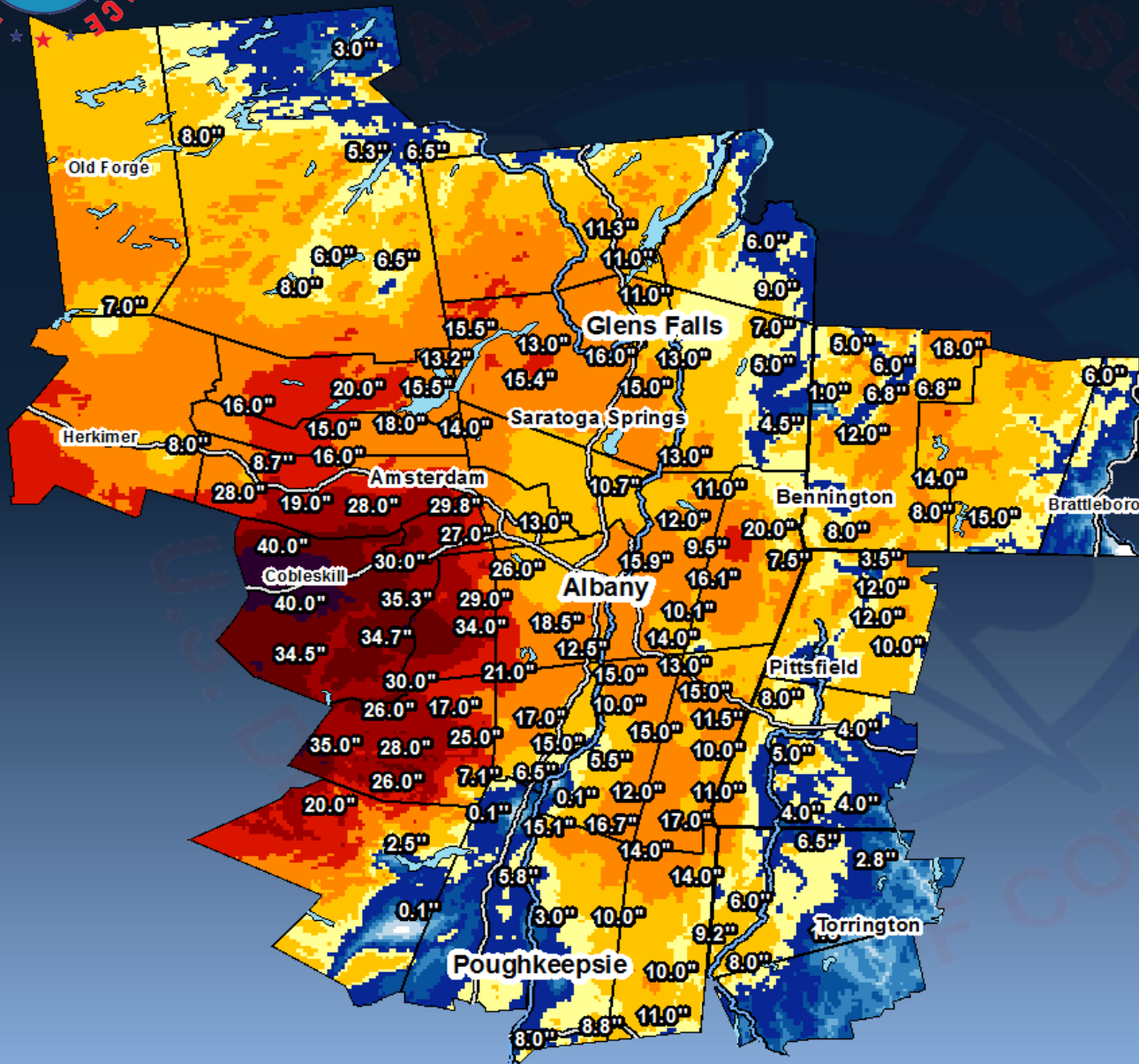
Photo: Dan Thompson, NWS Albany, NY



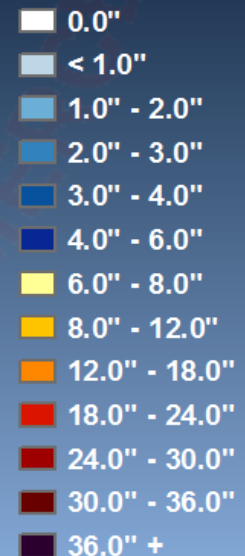
# National Weather Service Albany, NY

## Snowfall Analysis 03/01/2018 07:00PM to 03/03/2018 01:00AM

Data Source: Regional Observations(PNS)

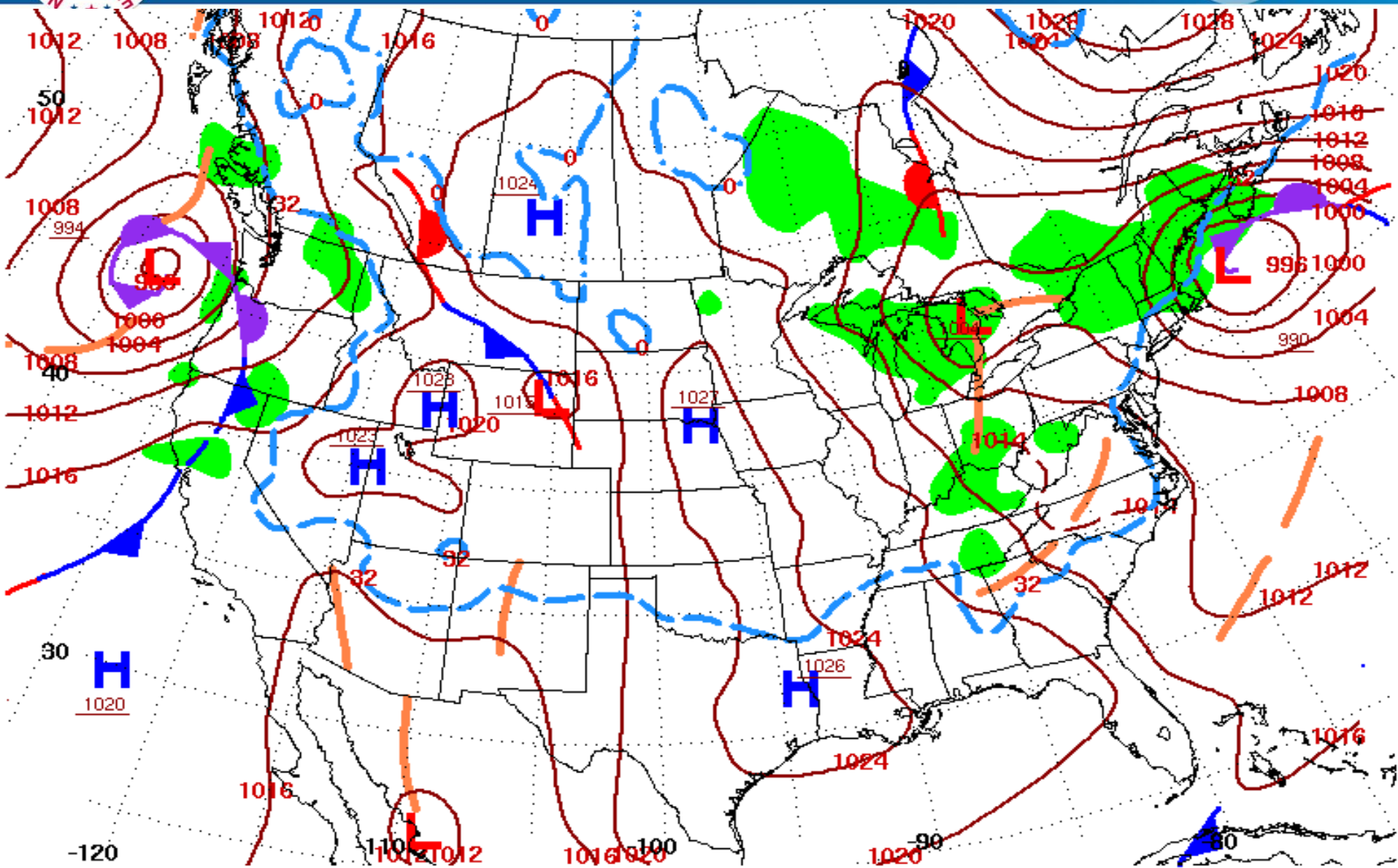


### Snowfall Analysis 0" - 36"





# Surface Map 700 AM 3/8/2018



Surface Weather Map at 7:00 A.M. E.S.T.



# Albany, NY March 8, 2018



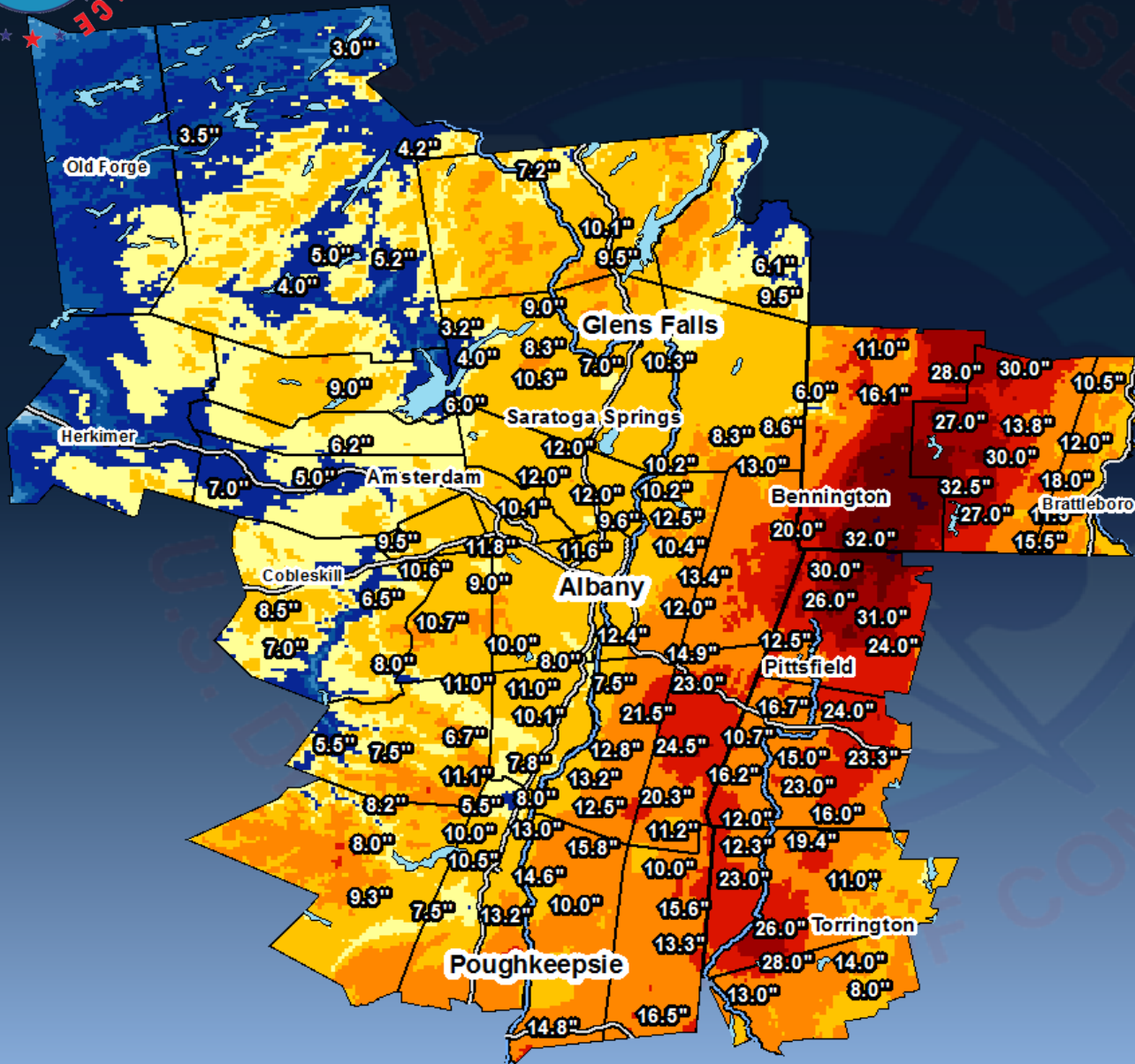
Photo: Dan Thompson, NWS Albany, NY



# National Weather Service Albany, NY

## Final Snowfall from March 7-8, 2018 Nor'easter

Data Source: Regional Observations(PNS)



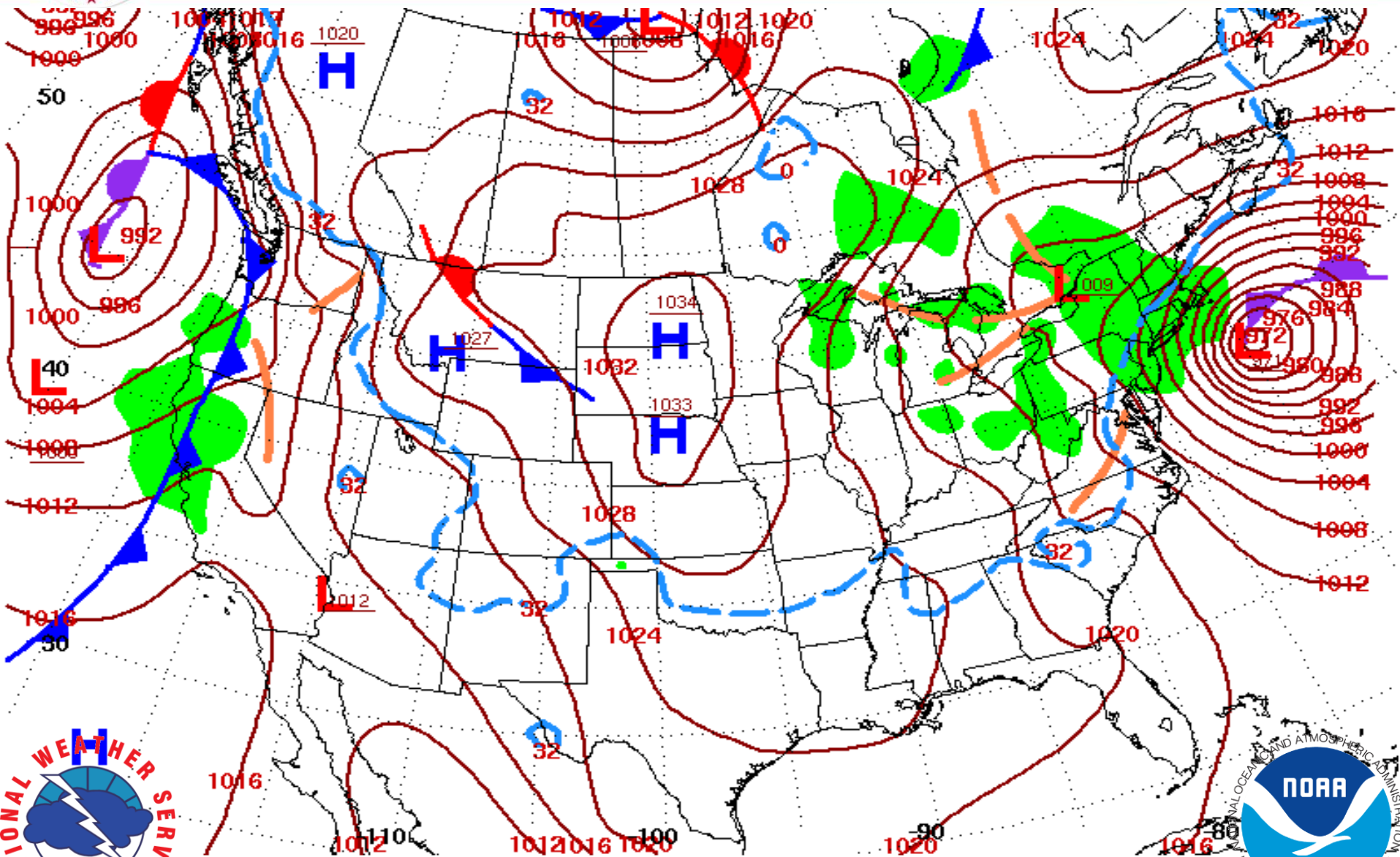
### Snowfall Analysis 0" - 36"



This is an experimental product. Care should be taken in using the data. Unofficial observations are plotted. Values at interpolated locations may not represent actual precipitation totals at that location.



# Surface Map 700 AM 3/13/2018



Surface Weather Map at 7:00 A.M. E.S.T.





# Woodford, VT March 15, 2018



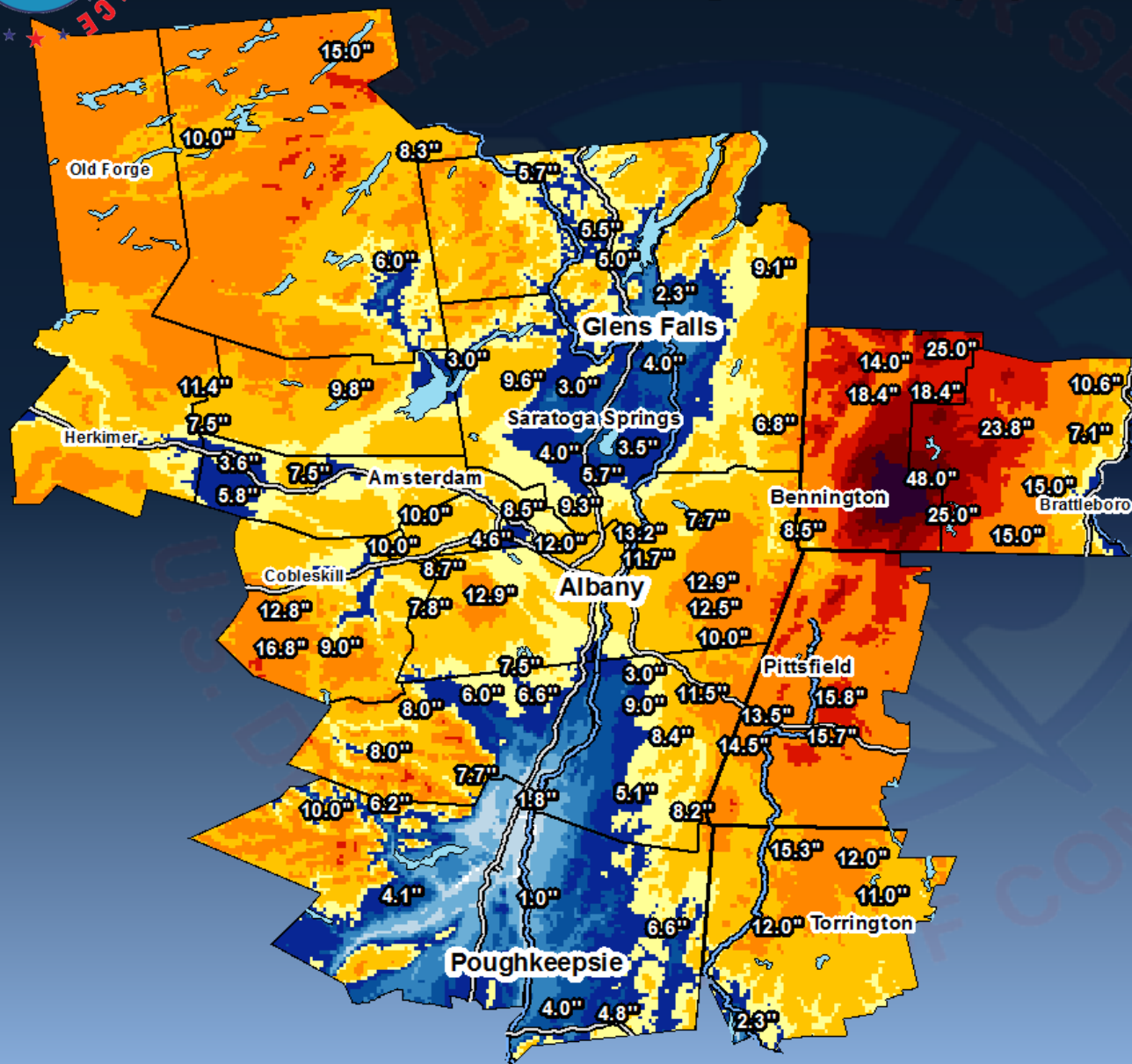
Photo: Mike Evans, NWS Albany, NY



# National Weather Service Albany, NY

## Snowfall Analysis 03/12/2018 08:00PM to 03/15/2018 08:00PM

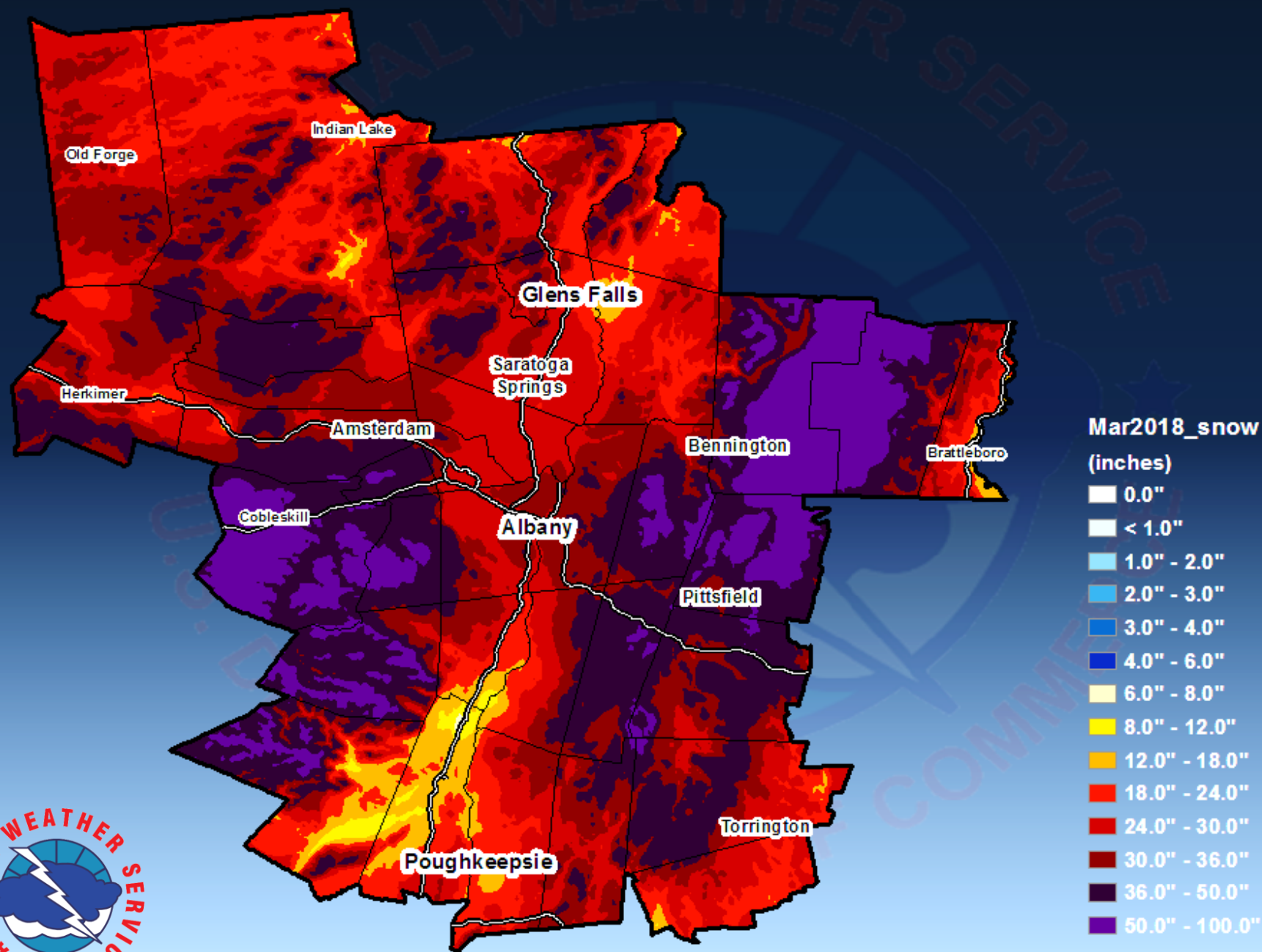
Data Source: Regional Observations(PNS)



### Snowfall Analysis 0" - 36"

- 0.0"
- < 1.0"
- 1.0" - 2.0"
- 2.0" - 3.0"
- 3.0" - 4.0"
- 4.0" - 6.0"
- 6.0" - 8.0"
- 8.0" - 12.0"
- 12.0" - 18.0"
- 18.0" - 24.0"
- 24.0" - 30.0"
- 30.0" - 36.0"
- 36.0" +

# Combined Snowfall from three Nor'easters - March 2018

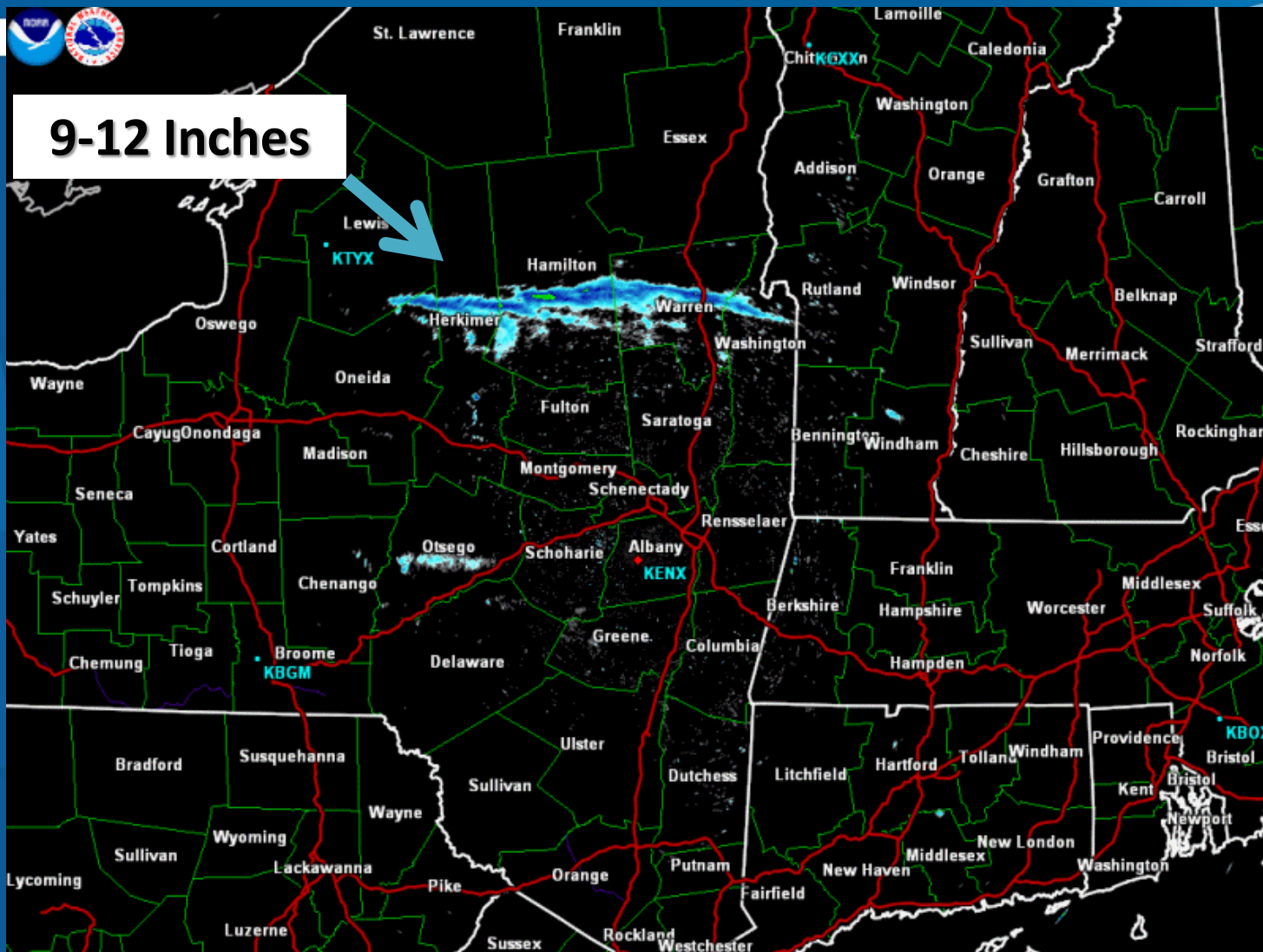


This is an experimental product. Care should be taken in using the data. Unofficial observations are plotted. Values at interpolated locations may not represent actual precipitation totals at that location.



# Lake Effect Snow

9-12 Inches



February 2<sup>nd</sup>-4<sup>th</sup>, 2017

Radar Imagery the night of February 3<sup>rd</sup>, 2017



# Snow-Water Ratio

Heavy Wet Snow

5:1 = 5" of snow melts to 1" of liquid

Typical Snow

10:1 = 10" of snow melts to 1" of liquid

Fluffy/Light Snow

30:1 = 30" of snow melts to 1" of liquid

Fluffier (light) snow = higher ratio

Heavy wet snow = lower ratio



# Ice Storms

1

## Setting the stage:

High pressure banks cold air against mountains. Weak storm sends warm air northeast.

2

## The ice storm:

Warm air flowing above cold air condenses into rain that falls through cold air and freezes.

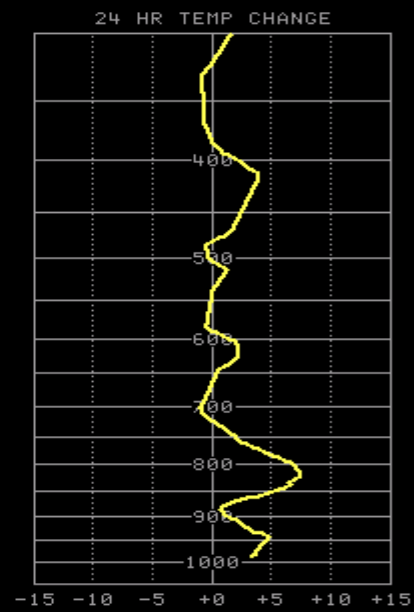
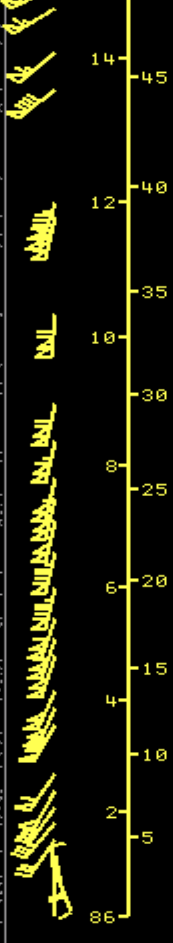
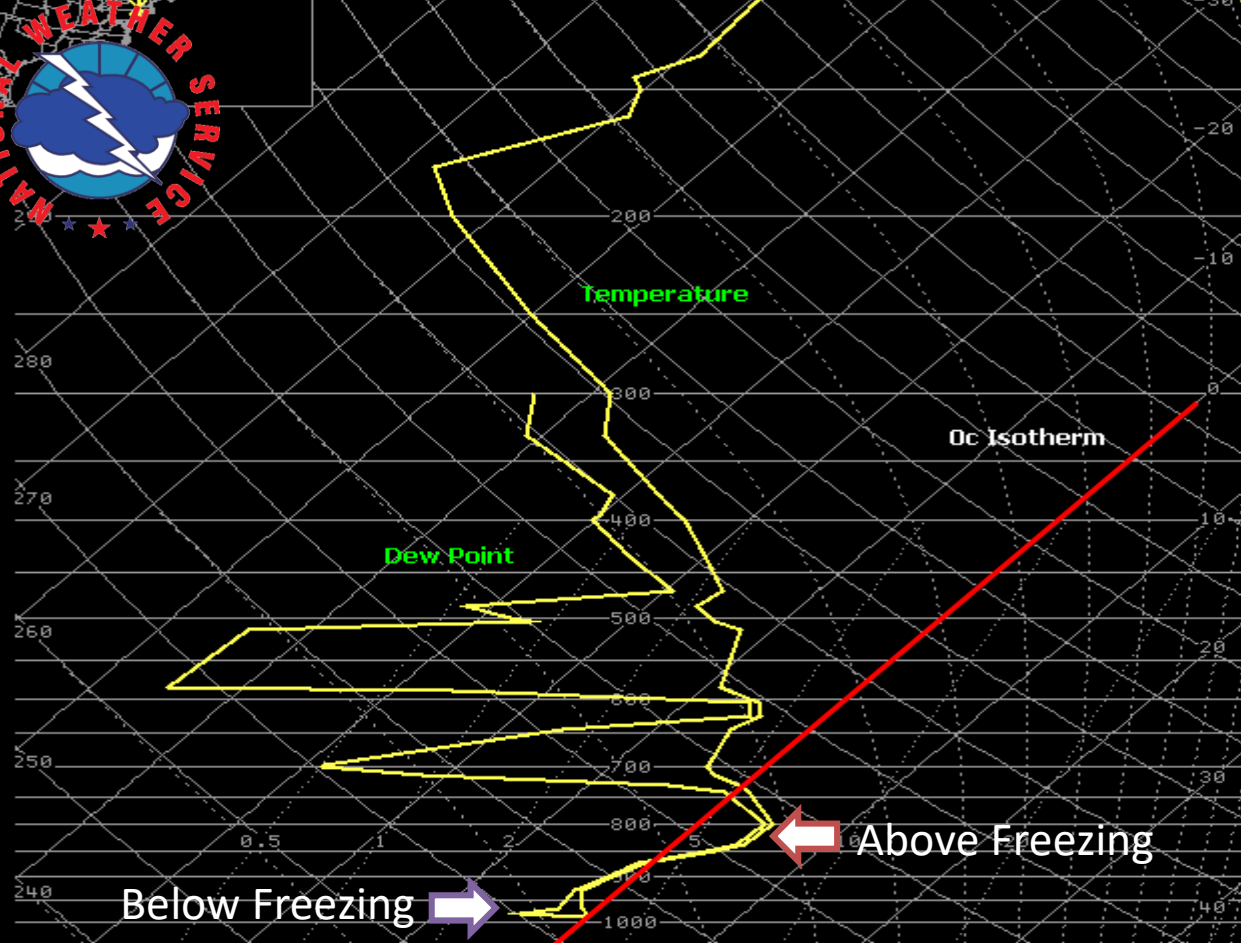




# December 11-12, 2008 Ice Storm



Photo: Ingrid Amberger and Neil Stuart, NWS Albany, NY



PRECIP WATER= 0.65 in  
 K-INDEX= -4  
 TOTALS INDEX= 36  
 SWEAT INDEX= 186  
 DRY MICROBURST POT=4: GST > 40 kts  
 FREEZING LEVEL= 360 ft ASL  
 WET-BULB ZERO HGT= 316 ft ASL  
 0-6 KM AVG WIND= 200°/54 kts  
 0-6 KM STM MTN (30R75)= 230°/40 kts  
 0-3 KM STM REL HELICITY= 425 m²/s  
 FORECAST MAX TEMP= 36°F  
 TRIGGER TEMP= 8°C/47°F  
 SOARING INDEX=NA  
 MDPI/WINDEX = 0.08/NA

\* -PARCEL- T=FCST MAX;Td=50 mb MEAN  
 \* MOD PARCEL P= 985 mb  
 \* MOD PARCEL T/Td= 36/27° F;2/-2° C  
 \* CONVECTIVE TEMP= 94°F  
 \* LIFTED INDEX= 24.4  
 \* CCL= 14353 ft ASL/ 575 mb  
 \* LCL= 2255 ft ASL/ 914 mb  
 LFC=NA  
 MAX HAILSIZE=NA  
 MAX VERTICAL VELOCITY=NA  
 EQUILIBRIUM LEVEL=NA  
 APPROX CLOUD TOP=NA  
 POSITIVE ENERGY ABV LFC=NA  
 NEGATIVE ENERGY BLW LFC=NA  
 BULK RICHARDSON NUMBER=NA



# Surface Temperatures

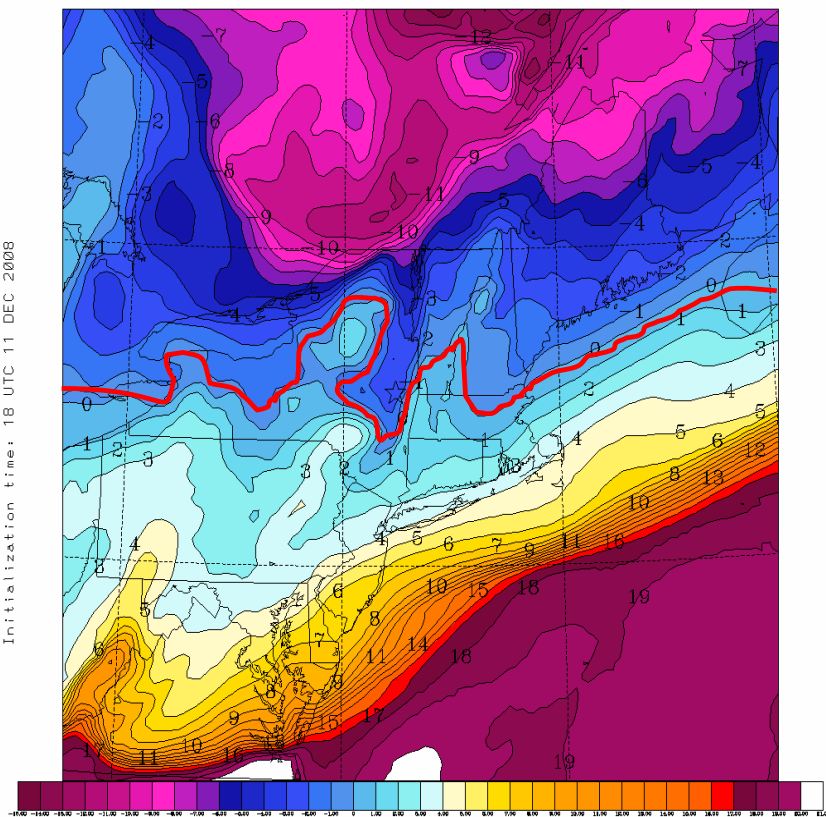
4 PM Dec 11

1 AM Dec 12

NORR Air Resources Laboratory  
This product was produced by an Internet user on the NORR Air Resources Laboratory's web site. See the disclaimer for further information (<http://www.arl.noaa.gov/ready/disclaim.html>).

NAM12 Archive

METEOROLOGICAL DATASET INFORMATION  
Initialization time: 18 UTC 11 DEC 2008



TEMPERATURE

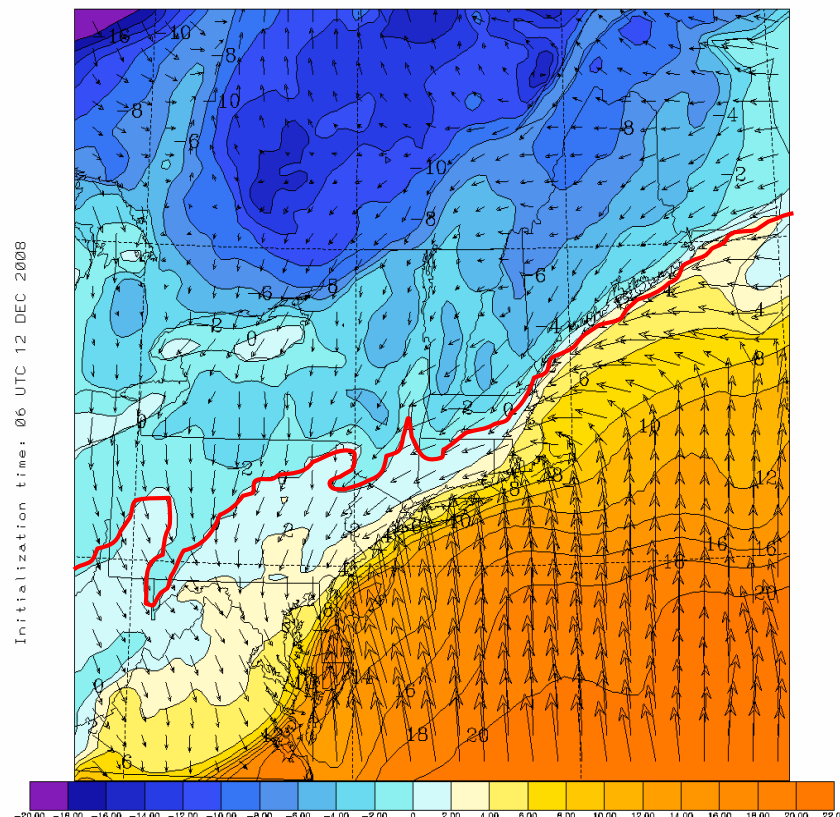
TEMP (DEGC), LVL=1000., 21 UTC 11 DEC 2008 (+ 03 H)

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION - AIR RESOURCES LABORATORY

NORR Air Resources Laboratory  
This product was produced by an Internet user on the NORR Air Resources Laboratory's web site. See the disclaimer for further information (<http://www.arl.noaa.gov/ready/disclaim.html>).

NAM12 Archive

METEOROLOGICAL DATASET INFORMATION  
Initialization time: 06 UTC 12 DEC 2008



WIND VECTORS

2 M TEMPERATURE

WVCT (KNTS), LVL= SFC , 06 UTC 12 DEC 2008 (+ 00 H )  
T02M (DEGC), LVL= SFC , 06 UTC 12 DEC 2008 (+ 00 H )

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION - AIR RESOURCES LABORATORY



Weather observations for the past three days

## Albany International Airport

www.srh.noaa.gov



Enter Your "City, ST" or zip code

Go

en espa ol

Date	Time (est)	Wind (mph)	Vis. (mi.)	Weather	Sky Cond.	Temperature (�F)				Pressure		Precipitation (in.)		
						Air	Dwpt	6 hour		altimeter (in.)	sea level (mb)	1 hr	3 hr	6 hr
								Max.	Min.					
12	11:51	NW 7	8.00	Overcast	BKN016 OVC044	33	30			29.54	1000.6			
12	10:51	NW 17 G 25	1.00	Light Snow Fog/Mist	BKN010 BKN013 OVC022	33	30			29.54	1000.7	0.03		
12	09:51	W 7	0.75	Light Snow Fog/Mist	OVC004	33	32			29.56	1001.4	0.05	0.10	
12	08:51	N 3	1.00	Light Rain Fog/Mist	OVC004	33	31			29.48	998.4	0.03		
12	07:51	NW 6	1.00	Light Rain Fog/Mist	OVC004	32	32			29.44	997.3	0.02		
12	06:51	NW 10	2.00	Light Rain Fog/Mist	BKN001 OVC008	32	31	32	31	29.43	997.0			0.90
12	05:51	N 6	5.00	Light Rain Fog/Mist	OVC006	32	31			29.46	997.7	0.01		
12	03:51	E 14 G 20	2.50	Freezing Rain Fog/Mist	OVC005	32	30			29.43	996.8	0.31	0.86	
12	02:51	Vrbl 6	2.50	Freezing Rain Fog/Mist	OVC005	32	30			29.62	1003.5	0.32		
12	01:51	N 8	2.50	Freezing Rain Fog/Mist	OVC007	32	30			29.66	1004.8	0.23		
12	00:51	N 10	1.75	Freezing Rain Fog/Mist	OVC005	31	29	31	29	29.67	1005.0	0.23		0.65
11	23:51	N 9	2.00	Freezing Rain Fog/Mist	OVC003	31	29			29.72	1006.8	0.11		
11	22:51	N 8	3.00	Light Freezing Rain	OVC005	31	29			29.81	1009.9	0.04		
11	21:51	N 5	3.00	Freezing Rain	OVC003	31	29			29.85	1011.0	0.08	0.27	
11	20:51	N 3	3.00	Freezing Rain	OVC005	30	28			29.92	1013.3	0.09		
11	19:51	N 6	3.00	Light Freezing Rain	OVC005	30	28			29.93	1013.9	0.10		
11	18:51	N 6	3.00	Light Freezing	OVC007	29	27	29	27	29.95	1014.3	0.10		0.33

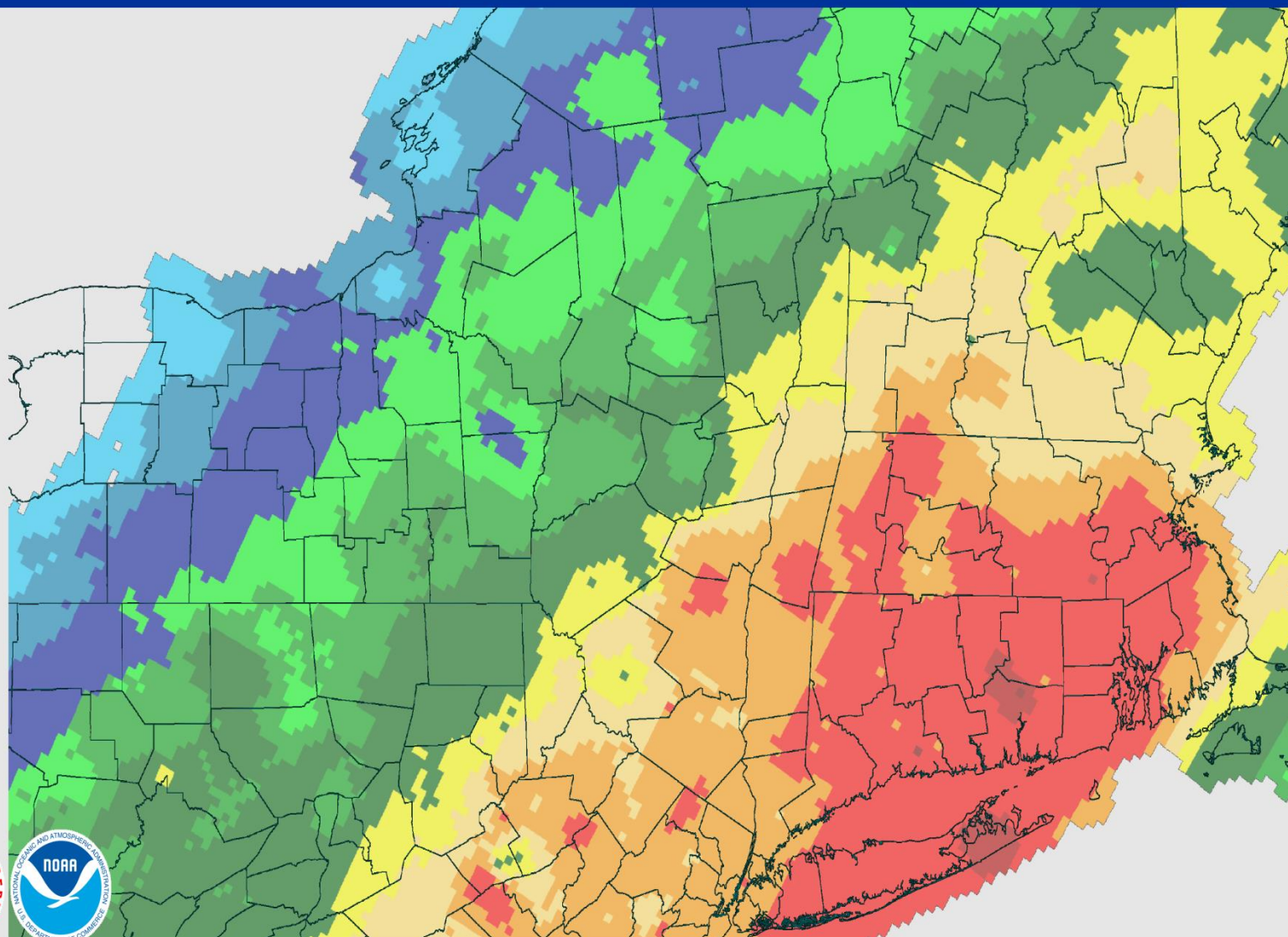


# Precipitation Map 12/11-12/2008

December 12, 2008 1-Day Observed Precipitation

Created on: September 15, 2018 - 15:54 UTC

Valid on: December 12, 2008 12:00 UTC





# Ice Accumulations 12/11-12/2008

• Peru, MA	1.0"	• Round Lake, NY	0.6"
• Schenectady, NY	0.9"	• Savoy, MA	0.6"
• Colonie, NY	0.8"	• Torrington, CT	0.5"
• Feura Bush, NY	0.8"	• Winsted, CT	0.5"
• Middleburgh, NY	0.8"	• Catskill, NY	0.5"
• Richmondville, NY	0.8"	• Brunswick, NY	0.5"
• Woodford, VT	0.8"	• Niskayuna, NY	0.5"
• Albany, NY	0.6"	• Readsboro, VT	0.5"
• Clifton Park, NY	0.6"	• Bellows Falls, VT	0.5"



# Ice Storm December 11-12, 2008

- ❄ Ice accumulated 0.50" to 1.00" on surfaces across parts of eastern NY and western New England. The southern Adirondacks had mainly snow and sleet which accumulated up to 12". Areas from the central and southeast Catskills across to the Berkshires and Litchfield Hills received 2 to 4 inches of rain which led to widespread urban and small stream flooding with some river flooding as well.
- ❄ Power outages and road closures due to snapped and downed trees, power poles and wires were reported. Some roads were closed for a week with power outages lasting just as long in some areas. An estimated 1.7 million utility customers lost power at the height of the storm.
- ❄ The Red Cross opened shelters across the Greater Capital District.



# How to Measure Ice Accretion





# Ice Accretion Examples

0.75" of flat ice here



Two ways to measure ice: **radial** surface (such as from a tree branch) or **flat** surface (such a metal post).

NWS forecasts **FLAT ICE** accretion.

If you measure ice from a radial object (i.e tree branch), you can convert to flat ice by **dividing** by 0.4.

Example: In top left picture, 3/16" on the right side of the branch + 7/16" on the left side of the branch divided by 2 equals 0.3" of **radial** ice. To convert to **flat** ice,  $0.3" / 0.4 = 0.75"$

0.5" of flat ice here



**Preferred flat surfaces for measurements**

Photos: Neil Stuart - NWS Albany, NY  
Dec 11, 2008 (top) Jan 15, 2007 (bottom)



# Snow Squall Warnings

## SNOW SQUALLS

"Snow squalls pose serious threats to personal safety and property and produce costly transportation disruptions due to multi-vehicle pileups."

For more information visit [weather.gov](http://weather.gov)

**THERE IS NO SAFE PLACE ON A HIGHWAY WHEN SNOW SQUALLS ARE APPROACHING**



# Snow Squall – View from Corning Tower

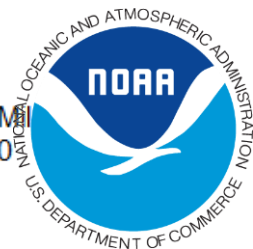
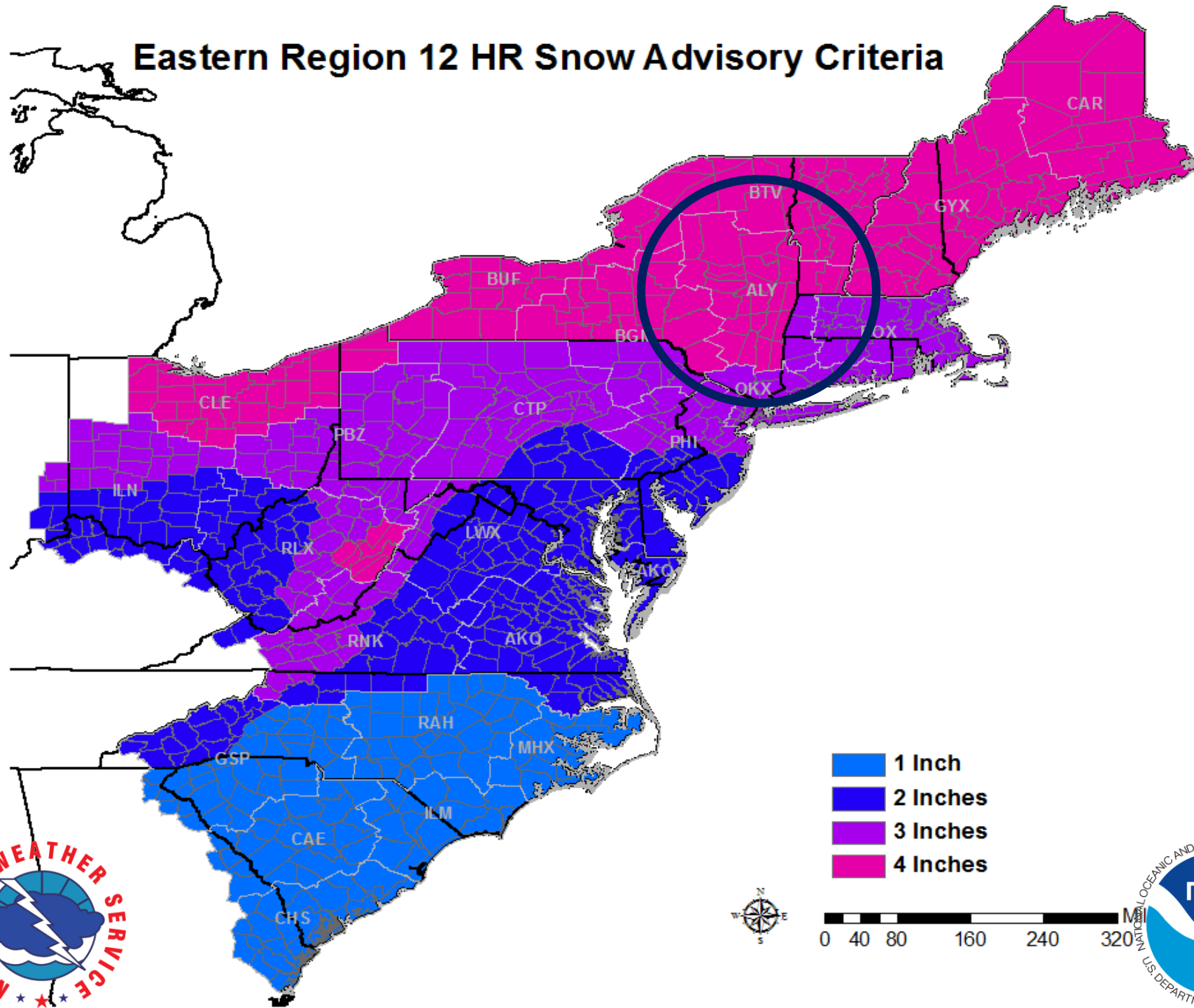


November 21, 2018

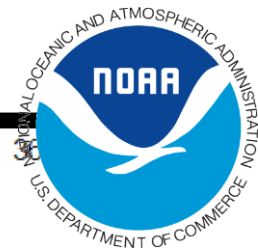
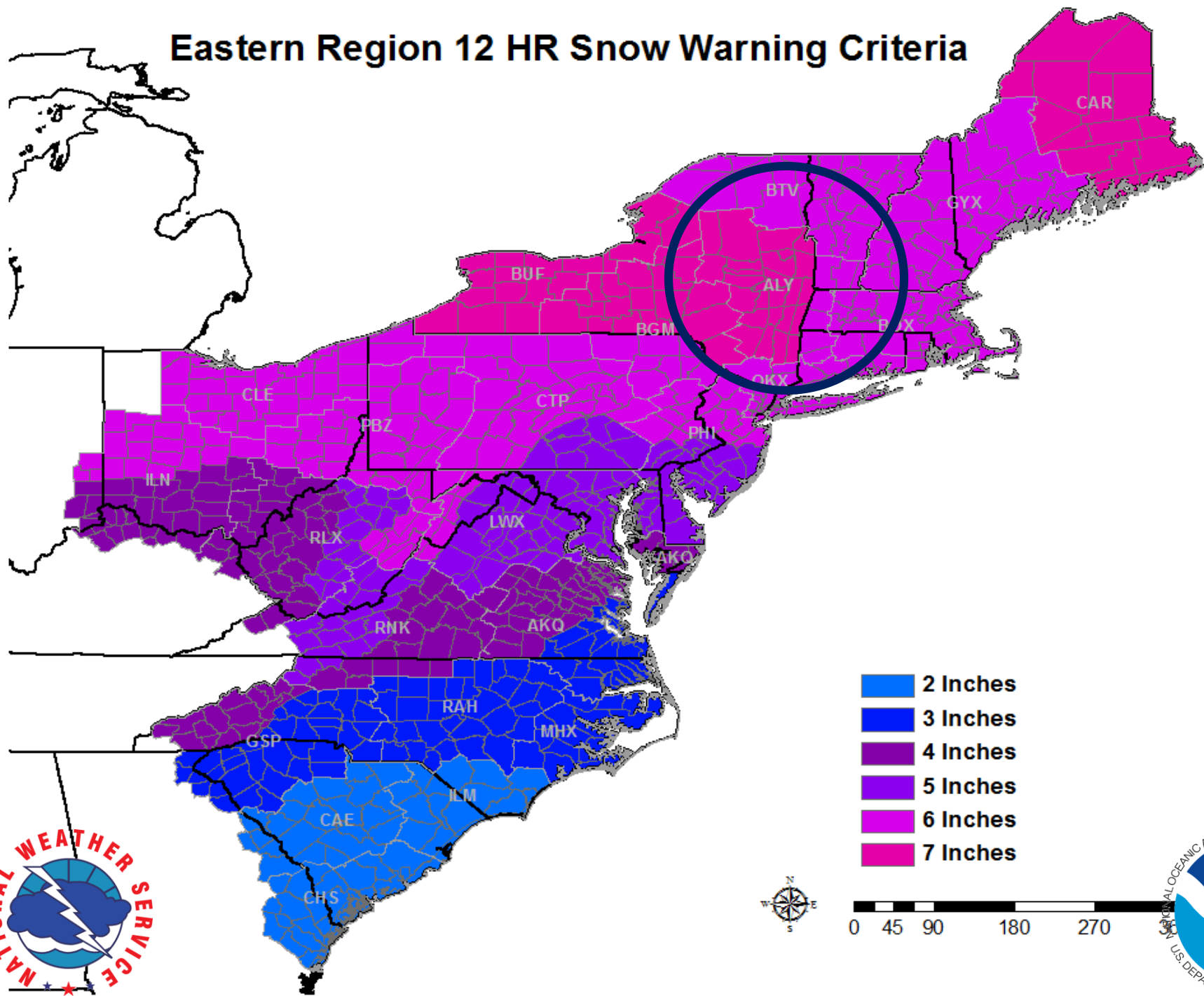


# Winter Weather Forecasting and Thresholds

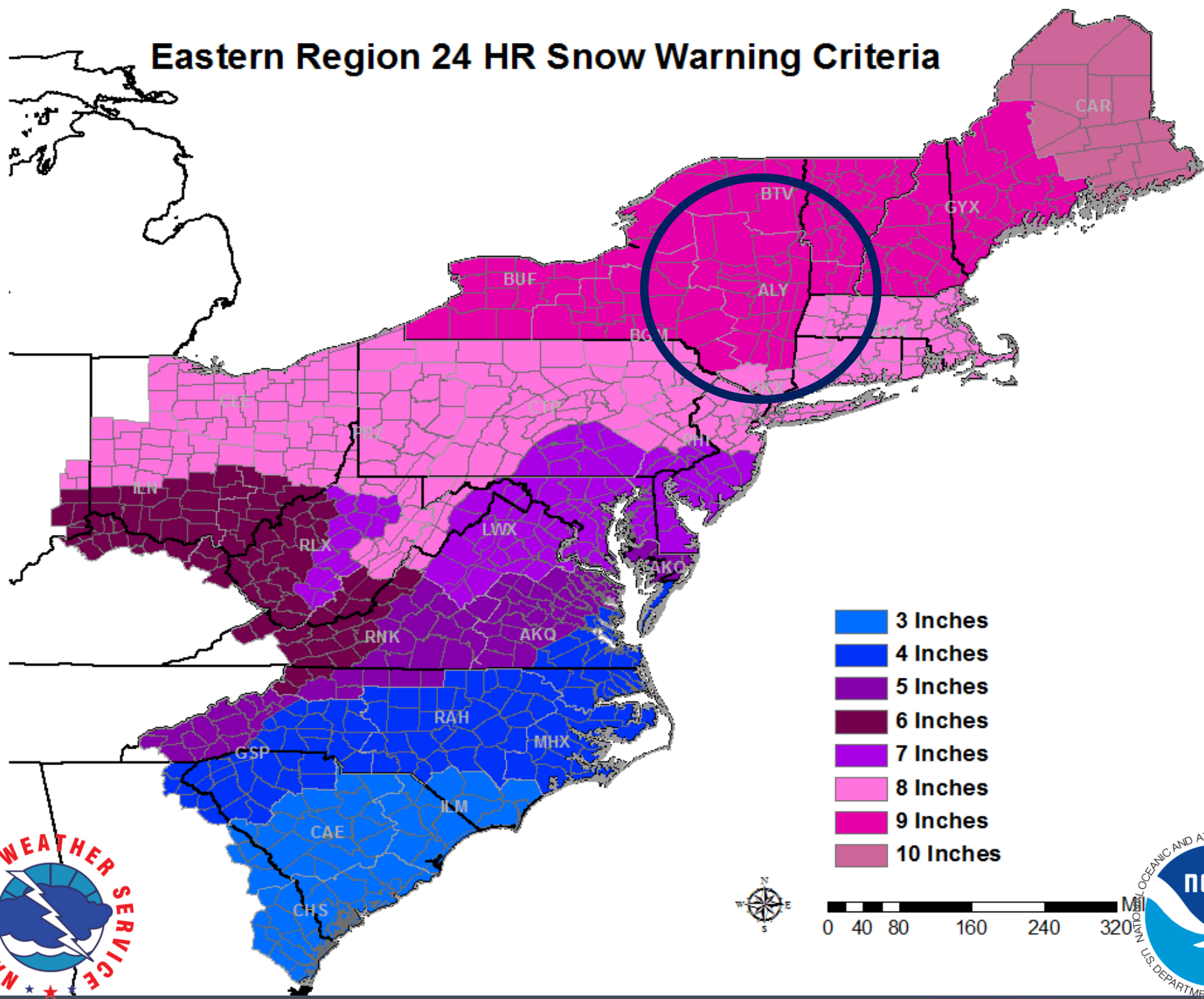
# Eastern Region 12 HR Snow Advisory Criteria



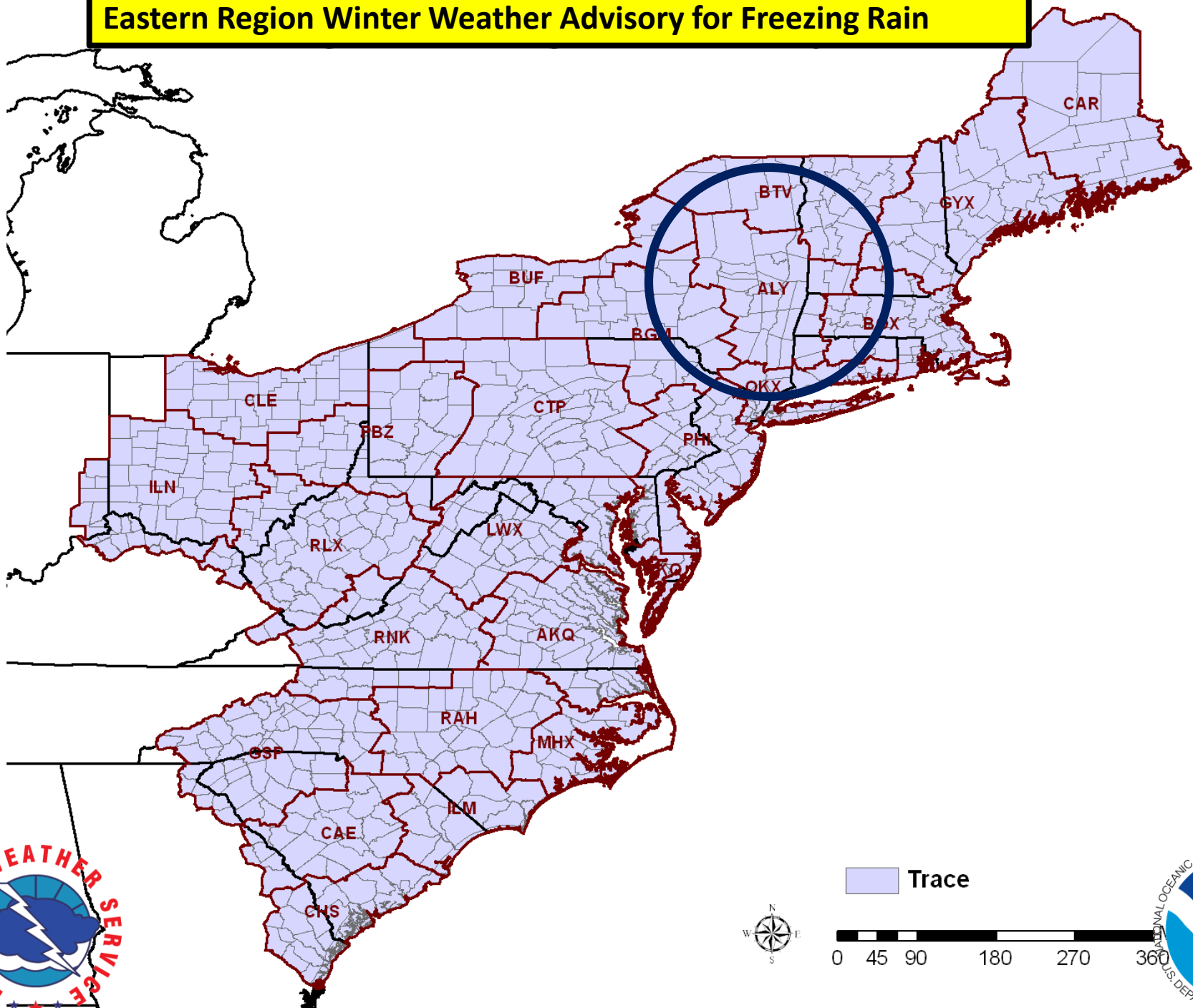
# Eastern Region 12 HR Snow Warning Criteria



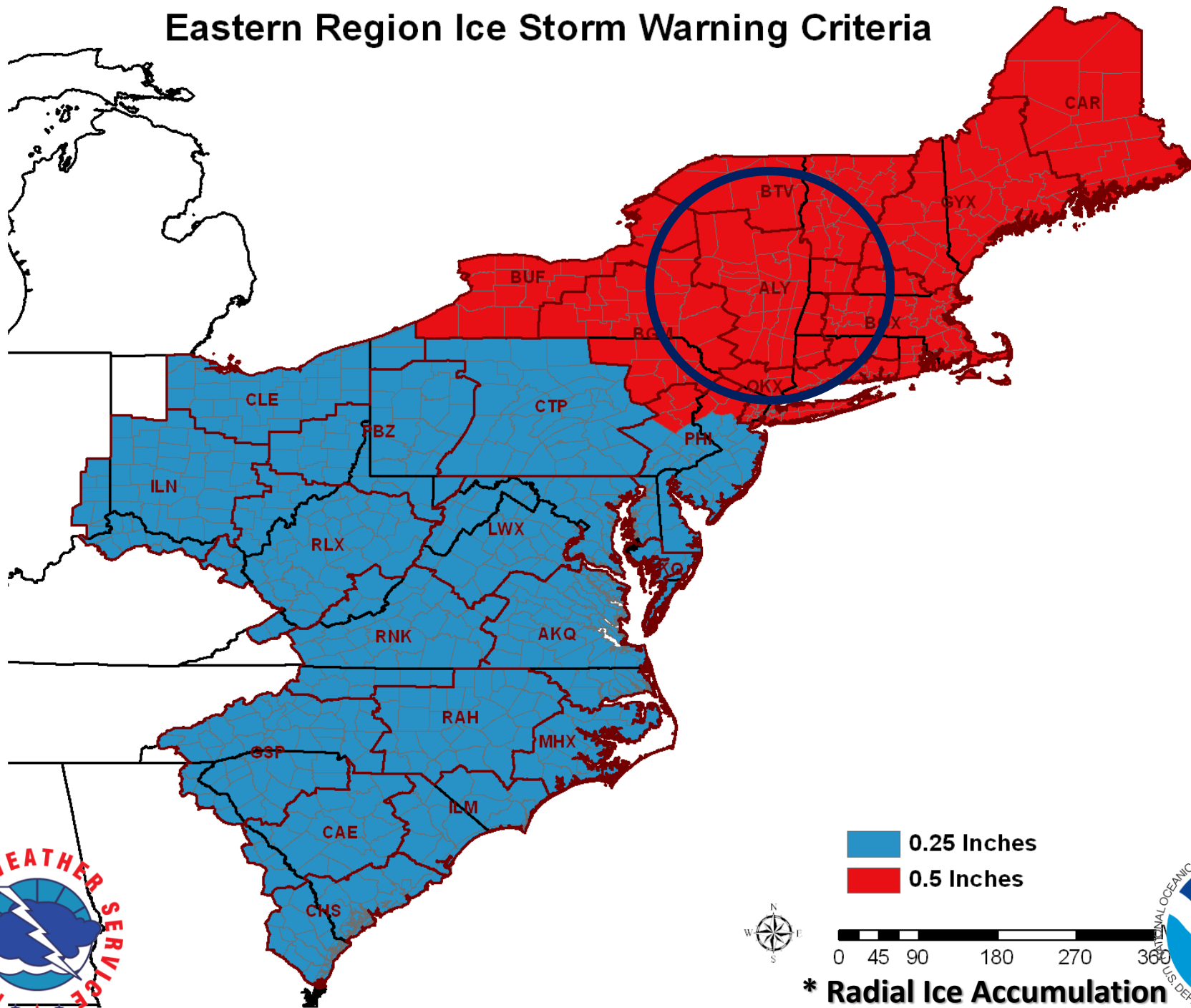
# Eastern Region 24 HR Snow Warning Criteria



# Eastern Region Winter Weather Advisory for Freezing Rain



# Eastern Region Ice Storm Warning Criteria



\* Radial Ice Accumulation



# Wind Chill



## NWS Windchill Chart



		Temperature (°F)																		
		Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63	
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72	
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97	
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

Frostbite Times

30 minutes

10 minutes

5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

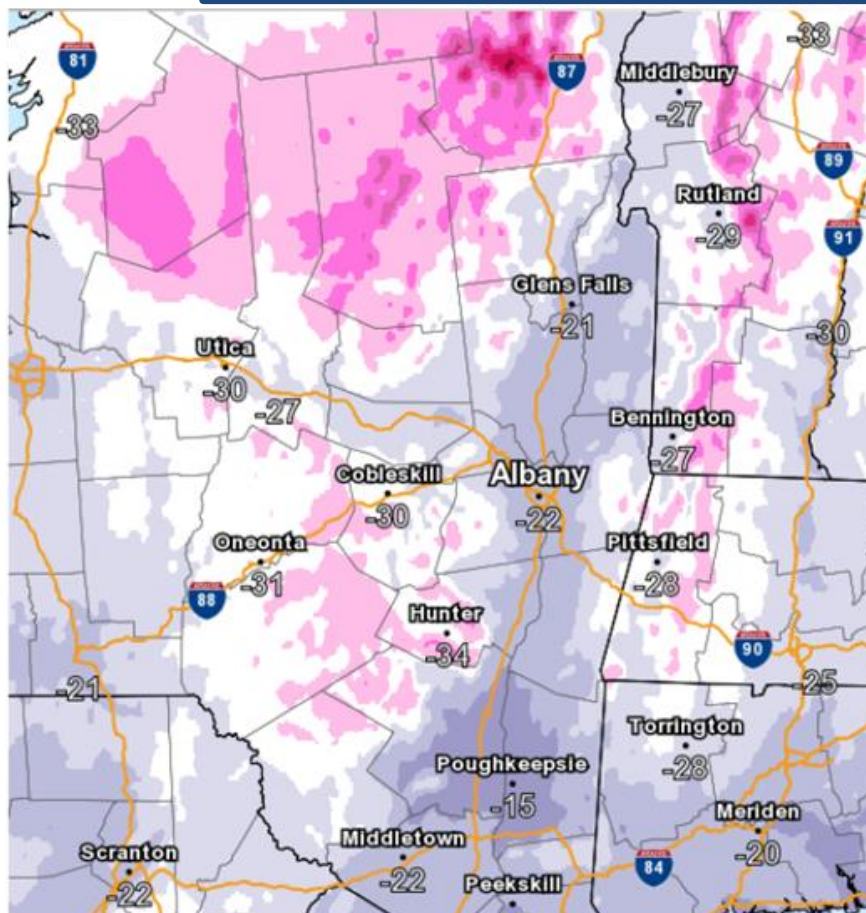
Effective 11/01/01



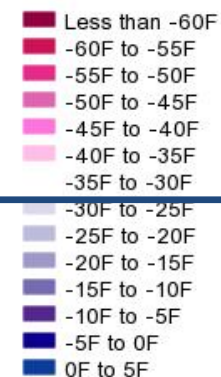
# Wind Chill



## Forecast Wind Chills for Feb 13-14 2016



Lowest Wind Chills  
Saturday night into  
Sunday morning.



<http://www.weather.gov/albany>



# Wind Chill



## MASSACHUSETTS

### ...BERKSHIRE COUNTY...

2 SE ADAMS	-46.0	647 AM	2/14	CWOP
PITTSFIELD MUNICIPAL	-43.0	654 AM	2/14	ASOS
HARRIMAN-AND-WEST AI	-36.0	652 AM	2/14	ASOS
3 NNE PITTSFIELD	-34.0	748 AM	2/14	CWOP
4 NNW SOUTH EGREMONT	-34.0	834 AM	2/14	CWOP
3 SW WILLIAMSTOWN	-32.0	737 AM	2/14	CWOP
1 NE GREAT BARRINGTO	-26.0	816 AM	2/14	CWOP
1 S STAMFORD	-19.0	704 AM	2/14	CWOP
1 SE PITTSFIELD	-16.0	743 AM	2/14	CWOP

## NEW YORK

### ...ALBANY COUNTY...

1 W KNOX	-37.0	714 AM	2/14	CWOP
2 SSE DELMAR	-30.0	802 AM	2/14	CWOP
COHOES	-12.0	726 AM	2/14	CWOP

### ...COLUMBIA COUNTY...

2 N NIVERVILLE	-25.0	725 AM	2/14	CWOP
2 SSW CHATHAM	-25.0	704 AM	2/14	CWOP

### ...DUTCHESS COUNTY...

1 ENE CORNWALL ON HU	-27.0	747 AM	2/14	WXFLOW
FAIRVIEW	-25.0	819 AM	2/14	CWOP
1 NNW WAPPINGERS FAL	-21.0	733 AM	2/14	CWOP
2 SSW PLEASANT VALLE	-16.0	825 AM	2/14	CWOP
BEACON	-16.0	826 AM	2/14	CWOP

### ...FULTON COUNTY...

2 ESE JOHNSTOWN	-43.0	814 AM	2/14	SAT
2 SSE BROADALBIN	-37.0	731 AM	2/14	CWOP
IRVING POND	-24.0	725 AM	2/14	SNOCOR

### ...GREENE COUNTY...

4 NE FLEISCHMANN'S	-43.0	700 AM	2/14	CWOP
LANESVILLE	-13.0	655 AM	2/14	SNOCOR

### ...HAMILTON COUNTY...

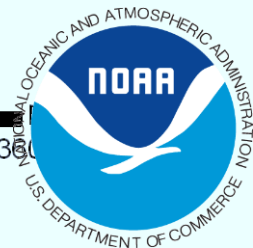
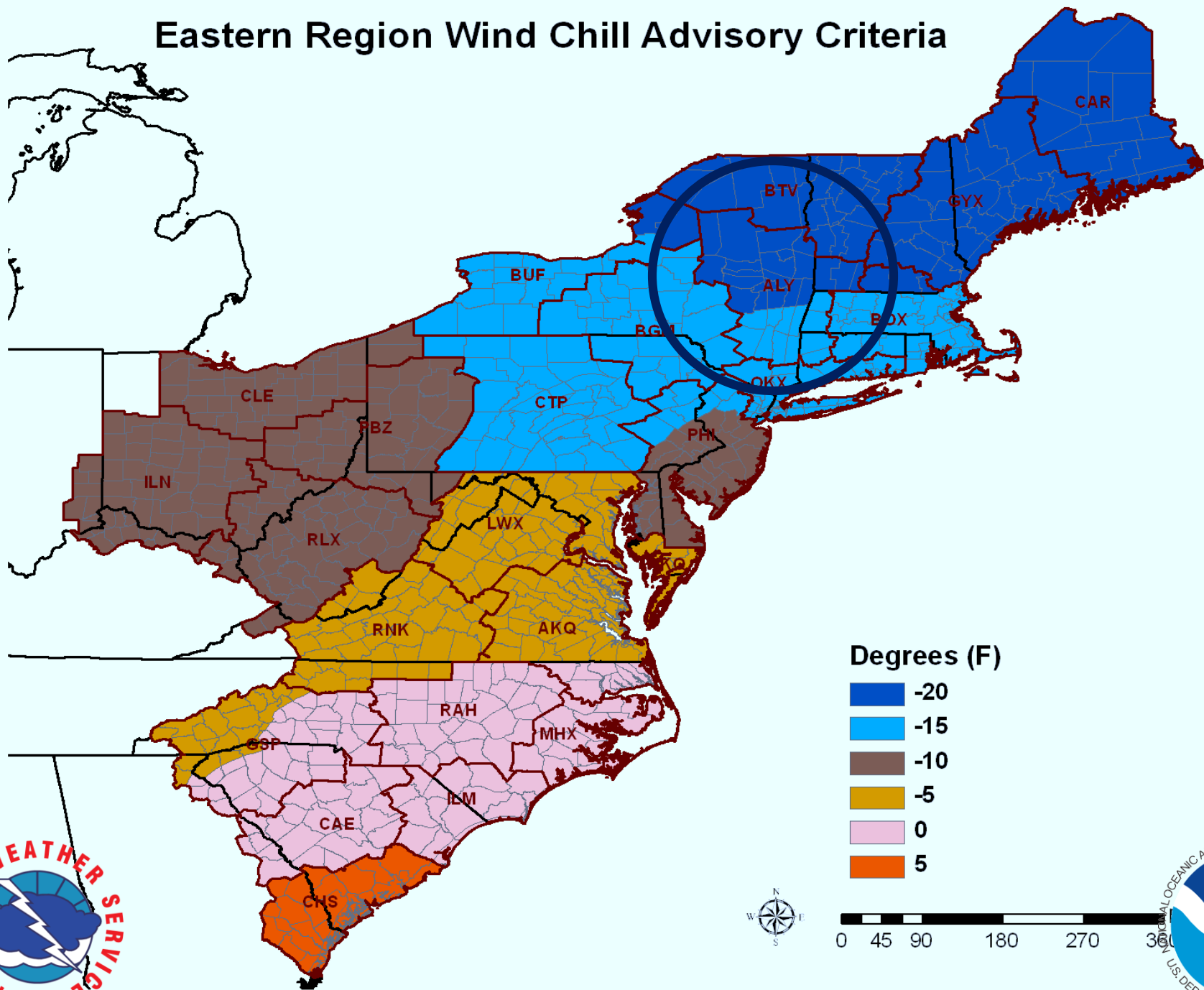
1 ESE EAGLE BAY	-27.0	812 AM	2/14	CWOP
2 SE INDIAN LAKE	-22.0	749 AM	2/14	CWOP

### ...HERKIMER COUNTY...

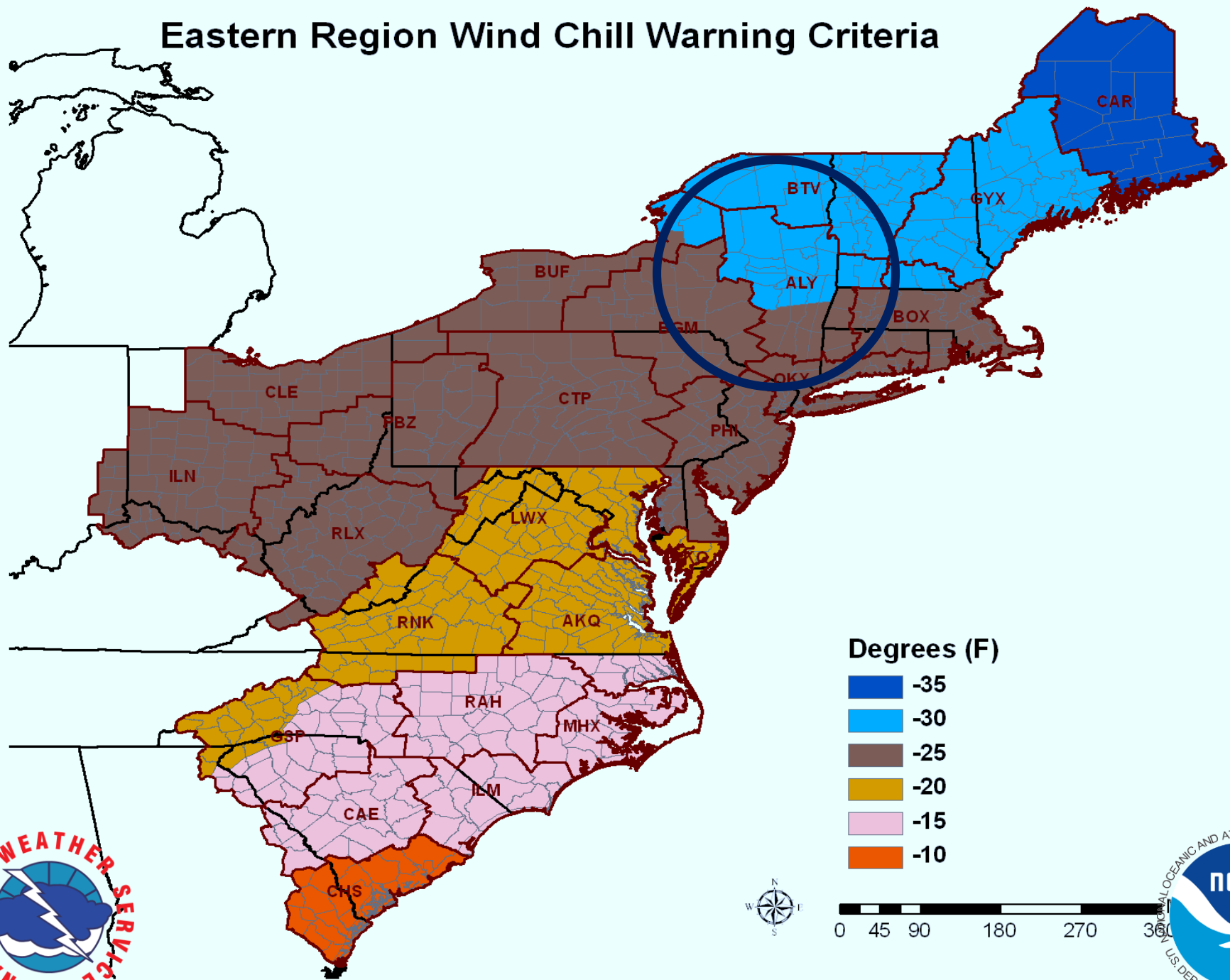
1 WNW LITTLE FALLS	-41.0	715 AM	2/14	CWOP
BIG MOOSE	-32.0	719 AM	2/14	CWOP
DOLGEVILLE	-21.0	654 AM	2/14	CWOP

Observed Wind  
Chills  
-35 F to -46 F  
Sunday morning  
2/14/2016

# Eastern Region Wind Chill Advisory Criteria



# Eastern Region Wind Chill Warning Criteria





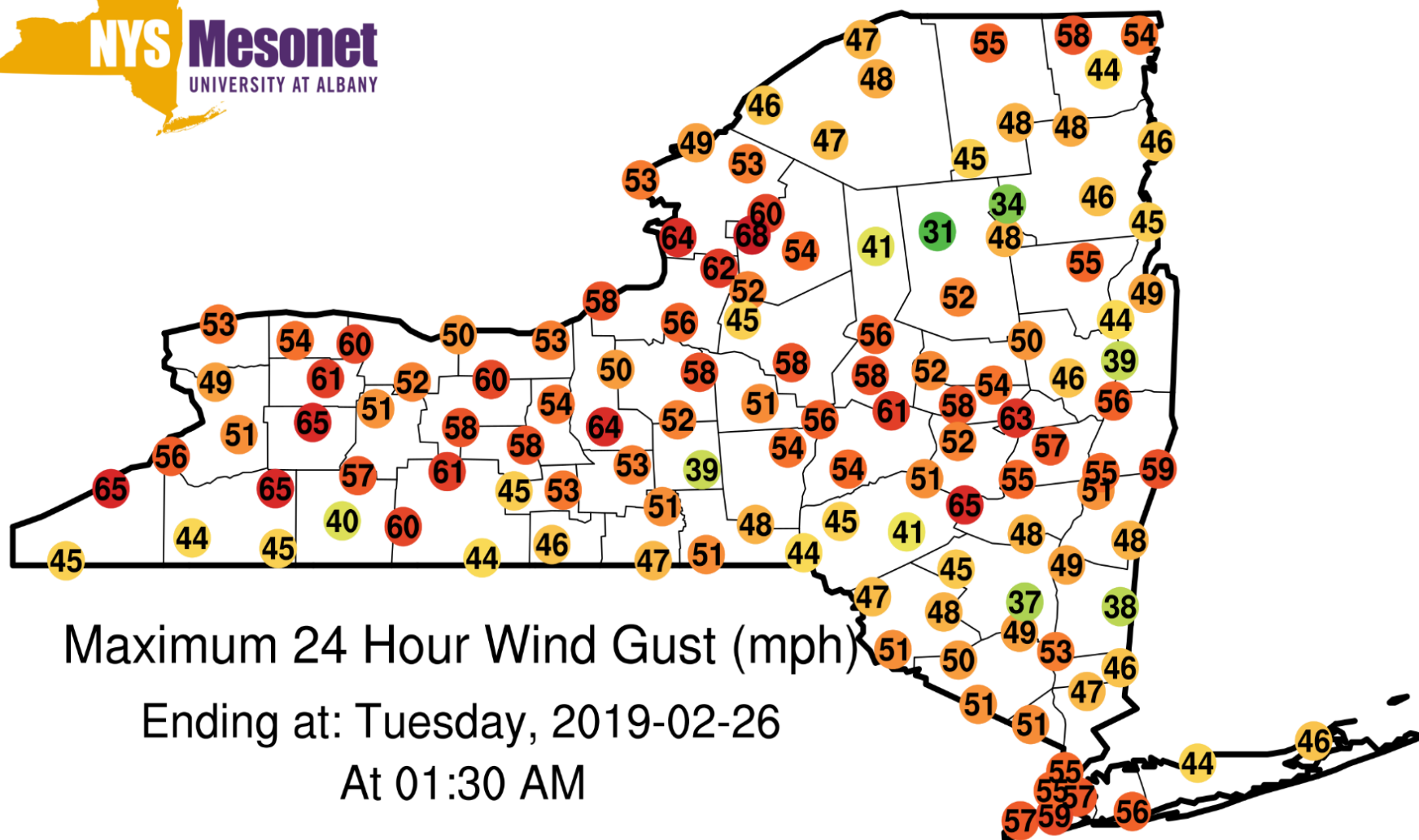
# High Wind Events

**Wind Advisory:** Issued for sustained winds 31-39 mph for 1 hour or longer, or for gusts 46-57 mph

**High Wind Warning:** Issued for sustained winds of 40 mph or more for 1 hour or longer, or for gusts 58 mph or greater

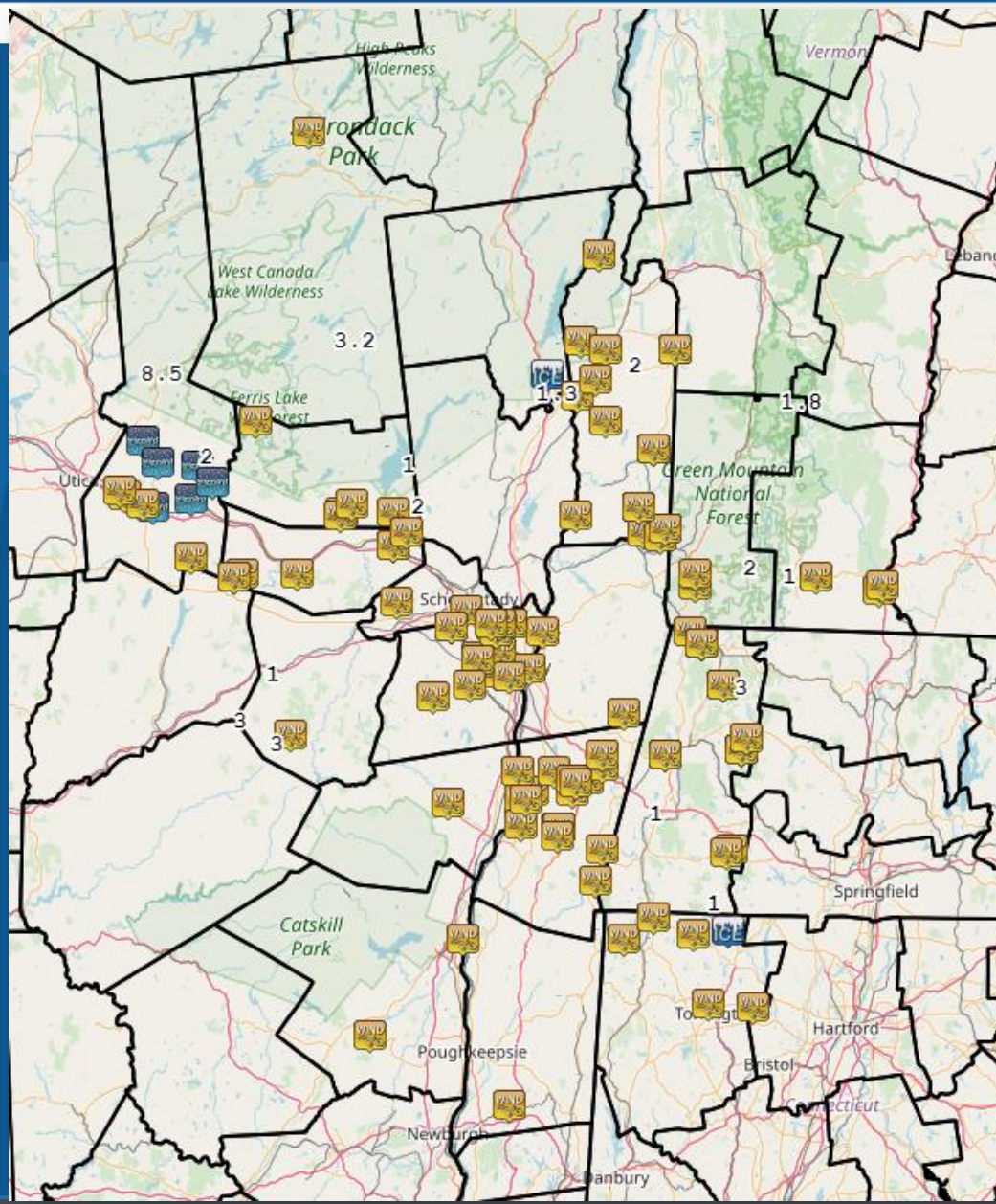


# February 25, 2019 High Wind Event





# February 25, 2019 High Wind Event





# Quick 5 Minute Break

AMBASSADOR<sup>TM</sup>  
**WRN**  
WEATHER-READY NATION



# Winter Flood Events



# Economic Impacts of Flooding

Flooding & flood related events cause greater damage and more fatalities than any other natural disaster.

Flood damages average \$3.3 billion annually.

Flood-related fatalities reported as 94\* in 2019.

Floods account for about 80% of all presidential disaster declarations.

Sources: NWS Office of Hydrology

\*<https://www.weather.gov/arx/usflood>



# How Ice Jams Form??

## How ice jams form



### **Ice Jams Typically Occur Where the River's Transport Capacity is Exceeded**

- Obstructions in the Channel – Islands, Locks, Bridge Piers, Docks.
- Changes in the Channel – Narrowing of the Channel, Bends, Gorges, Intact Ice Cover.
- Change in the Channel Depth – Deep water to Shallow water.
- Merger of River Channels.



# Freeze-up Jam



Accumulation of ice that restricts the flow of water; may contain some broken border ice pieces.

(Source: CRREL)



# Break-up Jam



Accumulation of broken ice pieces that restricts the flow of water; may contain frazil ice or remnants of freeze-up jam.

(Source: CRREL)



# When Does The Ice Break Up?

**Basin Daily Average Temperature  $\geq 42^{\circ}\text{F}$**

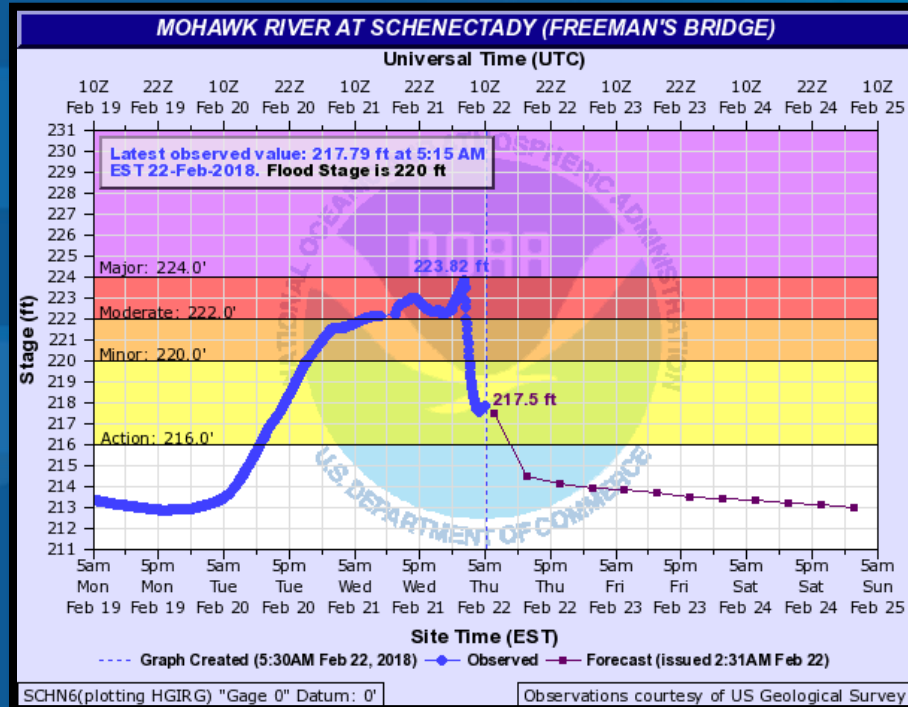
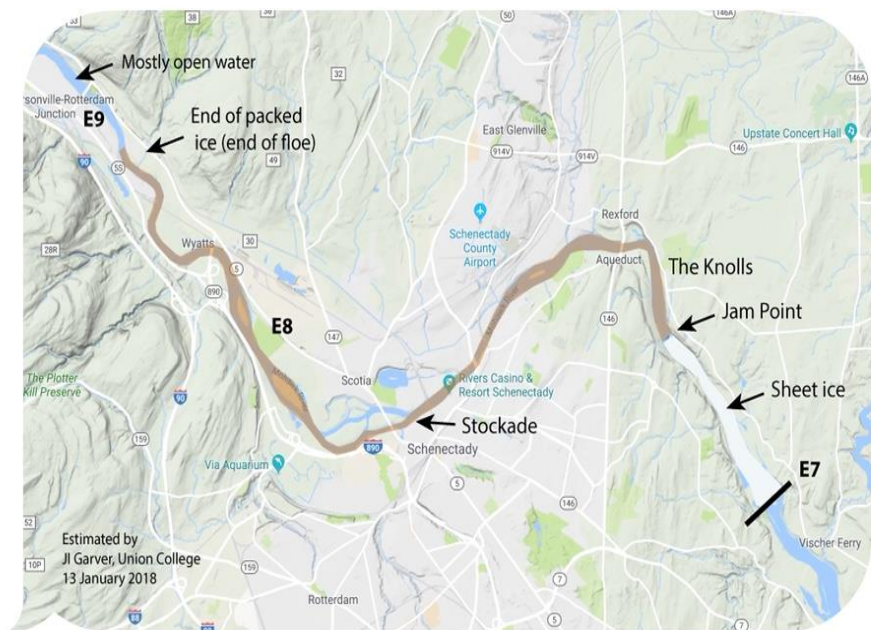
$$\text{Daily Average Temperature} = \frac{(\text{Max Temp} + \text{Min Temp})}{2}$$

Caveat 1: A quick thaw will result in some ice jams and flooding if ice is thick enough (2006-2007). Long sunny period with diurnal freeze/thaw cycle can rot/weaken ice (2008-2009).

Caveat 2: Rainfall/snowmelt with a thaw will enhance the potential for break up jams as rising water helps to lift and break up the ice. A very short thaw with little or no rain/snowmelt may not be enough to break up thick ice.



# February 2018 Ice Jams



Jam Release during the overnight February 22, 2018



Looking west at the  
Rexford Bridge. (January 2018)

Photo courtesy of Steve DiRienzo  
Warning Coordination Meteorologist





# Ice Jam Breaking along the Mohawk



Drone footage - February 21, 2018



# Jan. 24-25, 2019 Ice Jam Flooding

January 19–20: 1–2' of snow along/north of I-88/90

January 24–25: Thaw with 1–2" of rain (locally up to 4") atop the snowpack

Runoff due to heavy rain/snowmelt and ice jams resulted in minor to moderate flooding in the Hoosic/Housatonic basins. Many roads were closed or washed out in Washington County, NY, with evacuations in southern VT.



# Jan. 24-25, 2019 Ice Jam Flooding

A surge of water and ice swept down the Hudson in the predawn hours of the 25<sup>th</sup>, tearing 10 boats off their moorings and sending them over the Federal Dam in Troy

Some of the boats struck bridges, resulting in bridge closures during morning rush hour, including I-90





# Ice Safety

Factors to assess ice strength: appearance, thickness, daily temperature, snow cover, water depth under ice, size of body water, distribution of load on ice

If you do venture out on ice, do not go alone – Let others know where you are planning to go





# **The Role of a SKYWARN Spotter...**

**How to receive information  
and how to send us  
information**



# SKYWARN Activation including Amateur Radio

Spotter activation is initiated when a **Severe Winter Storm/Event (Ice Storm/Blizzard)** is expected by requesting the specific counties in the Hazardous Weather Outlook (HWO)

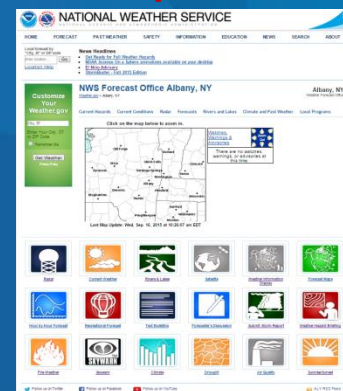
SKYWARN Amateur Radio Net Control is requested for NWS ALY when a **Severe Winter Storm/Event (Ice Storm/Blizzard)** is expected. It may also be requested for other high impact events

Spotters should use the quickest and most effective means available to send us reports

SKYWARN Amateur Radio Spotters should send reports to their County Net Control for relay to NWS ALY Net Control (if available) OR relay by 800# or Mobile/Web Based Form (if NWS Net Control not available)



# What happens when we issue a warning?



**PUBLIC**



# www.weather.gov/aly



Customize Your Weather.gov

City, ST

Enter Your City, ST or ZIP Code

Remember Me

Get Weather

Privacy Policy

Winter Weather

Weather.gov Albany, NY Winter Weather

Current Hazards | Current Conditions | Radar | Forecasts | Rivers and Lakes | Climate and Past Weather | Local Programs

Winter Weather

**Hazards & Assessments**

**Weather Hazards**

Map displays active watches, warnings, advisories and short term forecasts in the lower 48 states. Map automatically refreshes every five minutes.

Loop of sea-level pressures and fronts through day 7

**Hazards Assessment**

From Monday-Friday, the Climate Prediction Center (CPC) issues an outlook of weather and climate-related hazards to the United States for the next 3 to 14 days.

Interactive U.S. Hazards Outlook

**Current Conditions**

**Surface Analysis**

The Weather Prediction Center (WPC) produces surface maps (SWAN) depicting the analysis of highs, lows, fronts, troughs, surface boundaries, equal lines, and isobars.

Regional Observations  
Snowfall | Rainfall Reports

**Radar**

WDR-850 Doppler Radar

Albany NY  
Montgomery NY  
Northwest NY  
Northeast Ohio | Loop  
Nationwide | Loop

**Satellite**

GOES and other satellite imagery

East U.S. Visible | Loop  
East U.S. Infrared | Loop  
Local Visible | Loop  
Local Infrared | Loop

**National Snow Analyses**

Includes data on snow water equivalent, snow depth and more. The data can be view for a day or averaged for a two week period or a season.

CONUS & Northeast  
NERPC: Observed Snow Maps

**Forecasts & Guidance**

**Winter Weather Probability Charts**

Depicts the probability of snow and freezing rain reaching or exceeding specific amounts issued by the Weather Prediction Center.

Snow and Freezing Rain  
Composite "Wet"  
Surface Low Tracks

**Precipitation Probability Guidance**

Predicts the probability of exceeding a threshold snow field contour levels of probability that the 24-hour, 48-hour, or 72-hour accumulation of winter precipitation will equal or exceed the given threshold.

About the Probable Winter Precipitation  
Forecast Product

**Snowfall Accumulations**

Shows forecasted snowfall accumulations for a given time period.

Forecast Snowfall  
Regional 6-hourly  
Graphical Forecasts

**Precipitation Forecasts**

Shows forecasted precipitation for a given time period.

Local 6-hour QPF / Snow / Ice  
County Rainfall Exceedance  
Probabilities  
Regional 6-hourly  
Graphical Forecasts

**Short-Range Ensemble Forecast (SREF)**

The Storm Prediction Center (SPC) Short-Range Ensemble Forecast is produced by postprocessing the 21 members NCEP SREF plus the operational WRF-NAM for a total of 22 members. Several ensemble members

**Ice Accumulation**

Shows forecasted Ice Accumulations

**Precipitation Forecasts**

Quantitative Precipitation Forecasts issued by the Weather Prediction Center.

Day 1-3 QPF Loops  
6-hour - 12-hour - 24-hour  
Day 1-7 QPF Loop  
Northeast River Forecast Center  
QPF Forecasts

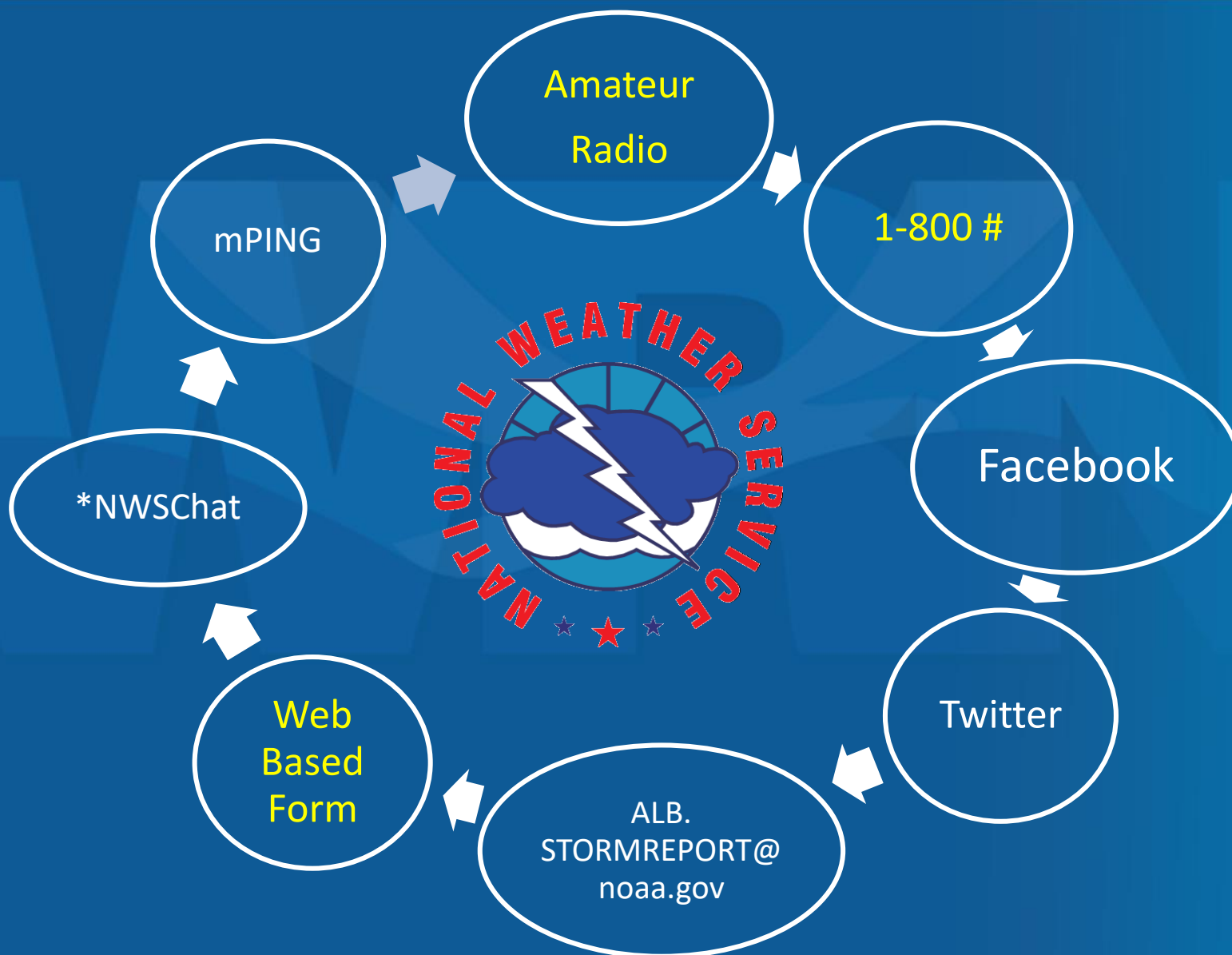
**NCEP SREF Plume Viewer**

There are three different model families with one control member and three positive and negative perturbation for each control.

NOTE: This viewer should be considered BETA/EXPERIMENTAL and is not supported



# How to Relay Your Report





# Information & links to send us storm reports


via [www.weather.gov/aly](http://www.weather.gov/aly)

**NWS Forecast Office Albany, NY**  
[Weather.gov](http://Weather.gov) > Albany, NY

Albany, NY  
Weather Forecast Office

Current Hazards | Current Conditions | Radar | Forecasts | Rivers and Lakes | Climate and Past Weather | Local Programs

Click a location below for detailed forecast.



Last Map Update: Sat, Dec. 10, 2016 at 10:28:08 am EST

Customize Your Weather.gov

City, ST

Enter Your City, ST or ZIP Code

☐ Remember Me

[Get Weather](#)

[Privacy Policy](#)

[Watches, Warnings & Advisories](#)

[Lake Effect Snow Advisory](#)

[Small Craft Advisory](#)

[Hazardous Weather Outlook](#)

[Radar](#)

[Current Weather](#)

[Rivers & Lakes](#)

[Satellite](#)

[Weather Information Display](#)

[Forecast Maps](#)

[Hour by Hour Forecast](#)

[Winter Weather](#)

[Forecaster's Discussion](#)

[Recreational Forecast](#)

[Text Bulletins](#)

[Submit Storm Report](#)

[Weather Hazard Briefing](#)

[Fire Weather](#)

[Skywarn](#)

[Climate](#)

[Drought](#)

[Air Quality](#)

## Report Weather to the NWS Albany

[Weather.gov](http://Weather.gov) > [Albany, NY](http://Albany.NY) > Report Weather to the NWS Albany

Albany, NY  
Weather Forecast Office

[Current Hazards](#) | [Current Conditions](#) | [Radar](#) | [Forecasts](#) | [Rivers and Lakes](#) | [Climate and Past Weather](#) | [Local Programs](#)

Please use one of the following to contact NWS Albany with your weather report...

e-mail: [Alb.stormreport@noaa.gov](mailto:Alb.stormreport@noaa.gov)



[www.facebook.com/NWSAlbany](http://www.facebook.com/NWSAlbany)



[www.twitter.com/NWSAlbany](http://www.twitter.com/NWSAlbany)

[Online Storm Report Entry Form](#)



# Making a Report

- Include your **name & contact info\***

*\*This is all voluntary information, however, would simplify with follow-up reports.*

- What are you reporting? Pictures are helpful, especially with ice jam flooding.
- When did it occur?
- Where did the event occur?



# Reporting Criteria

**Heavy Rain** – Measured 1” or More

**Flooding** – Streams, creeks or rivers out of banks or flooding of roads from poor drainage



**Ice Accumulation** – Any glaze on surfaces

**Snow Accumulation** – Every 2” or any accumulation not reflected in the forecast

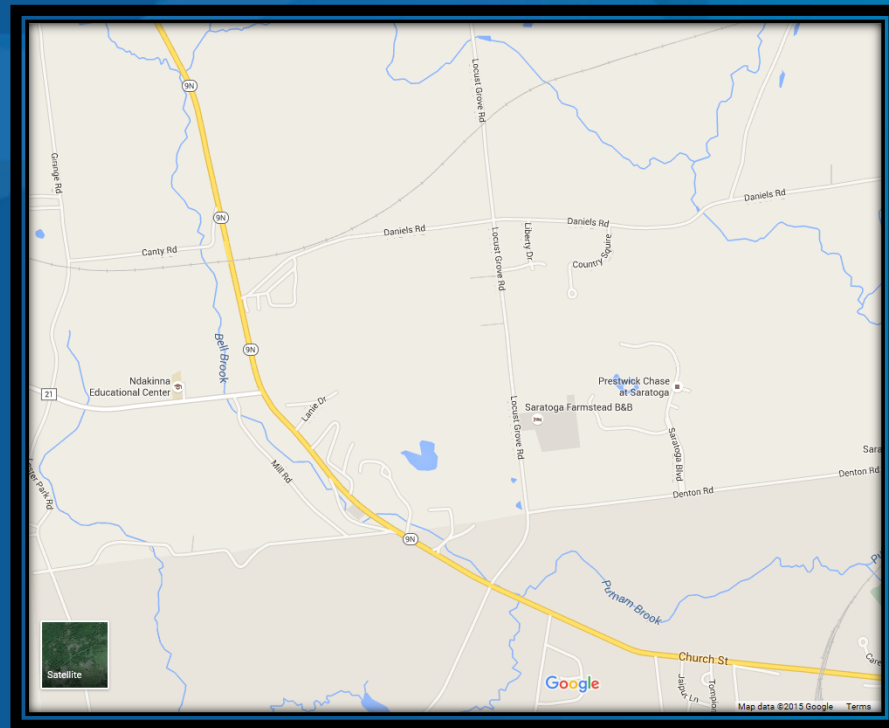
**Storm Total Snowfall** – At the end of the event





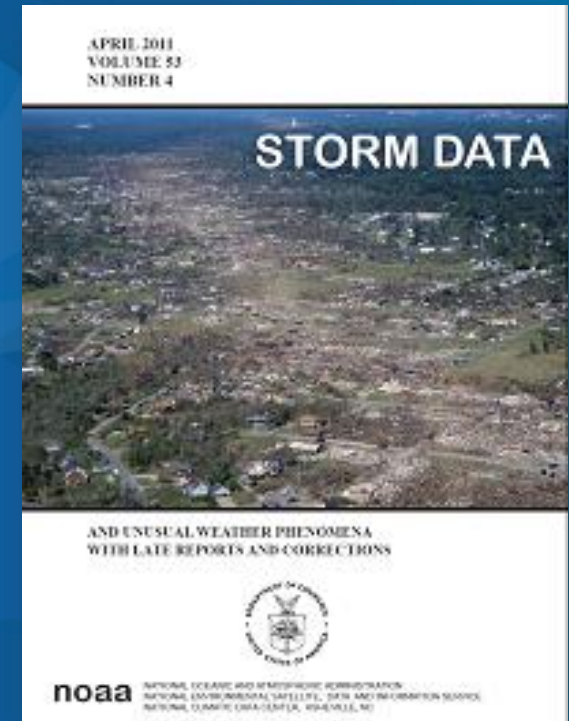
# When Referencing Locations

**Please be as specific as possible!** You are the local expert – we are not as familiar with the roads/cities in your county. **Please reference the nearest intersection or block number, mile marker or even latitude/longitude.**





# FEMA and Your Data





# For the Smart Phone Savvy!





Colonie NY

[mobile.weather.gov](https://mobile.weather.gov)



NWS

### Current Conditions

Albany International Airport

Updated: 16 Sep 10:51 am EDT



Partly Cloudy

72 °F

Wind Calm MPH

Dew Point 58 °F

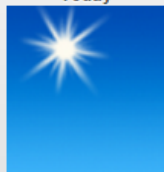
(61% RH)



### Forecast

16 Sep 10:51 am EDT

Today



Sunny  
Hi 84°F



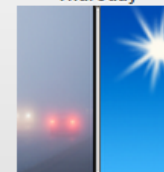
Tonight



Clear then Patchy Fog  
Lo 57°F



Thursday



Patchy Fog then Sunny  
Hi 85°F



Detailed Forecast

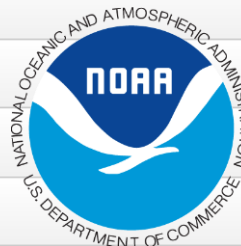
Radar

Satellite

Forecast Discussion

Forecast Graphics

Rivers/Lakes





# Other Weather Apps



Emergency - American Red Cross

American Red Cross Weather

**E** Everyone



Flood - American Red Cross

American Red Cross Weather

**E** Everyone



FEMA

FEMA

Federal Emergency Management Agency (FEMA)

**E** Everyone



mPing

University of Oklahoma Education

Unrated

## Weather warnings on the go!

**WIRELESS  
EMERGENCY  
ALERTS  
CAPABLE**



Imagine this: You're driving down the highway, humming along to your favorite tunes, when the cell phone stowed in your bag suddenly makes a strange noise. To investigate, you take the next exit and safely pull over to check the screen. Good thing you did: Your phone just alerted you to a tornado a few miles away in same county you're driving through.

Sound plausible? It is. America's wireless industry is helping to build a Weather-Ready Nation through a nationwide text emergency alert system, called Wireless Emergency Alerts (WEA), which will warn you when weather threatens. [Read the rest of the article on NOAA.gov](http://NOAA.gov).





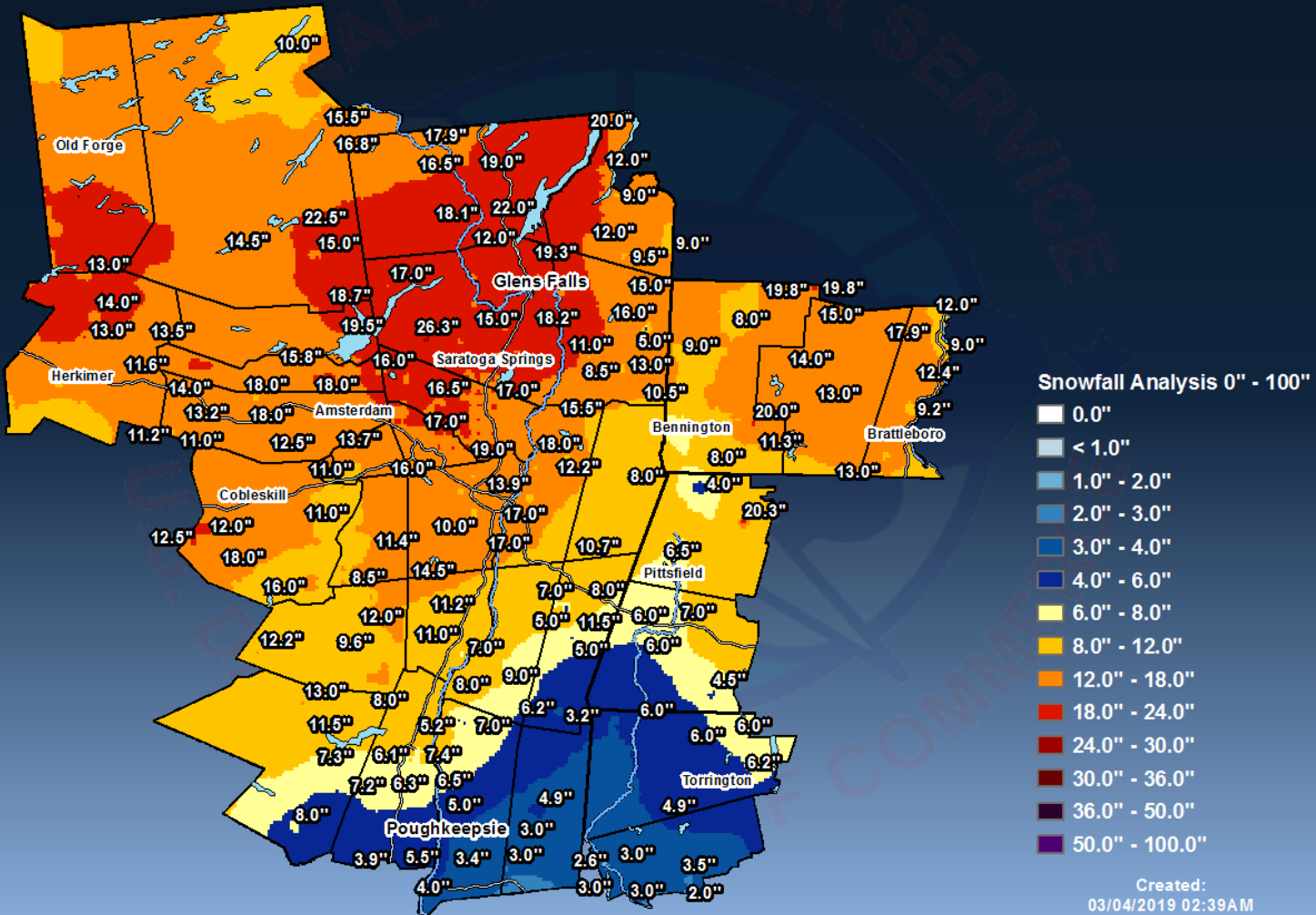
# Join CoCoRaHS!

Daily Snow (in)  
New York 1/2

Become  
www.

## National Weather Service Albany New York Snowfall Analysis 01/19/2019 01:00PM to 01/20/2019 01:00PM

Analysis Data Source: NOHRSC and Regional Observations



This is an experimental product. Care should be taken in using the data. Unofficial observations are plotted. Values at interpolated locations may not represent actual precipitation totals at that location.

the  
nity of  
300  
RaHs  
vers  
astern  
estern  
gland!

emails  
NWS  
with  
now  
best  
ring  
ces



# TEST TIME

(5 questions)

An 80% or  
higher is  
required to  
pass...



**JUST  
KIDDING!**



# Question #1

When lighter warm air is moving over/forced over cold air forming low cloud tops that can result in snow or rain conditions, what kind of winter storm is this called?

A. Overrunning

B. Lake Effect

C. Nor'easter

D. Alberta Clipper



# Question #2

Approximately  
what is the  
current  
snowfall  
depicted by  
this ruler?



- A. 14.0 inches
- B. 14.5 inches**
- C. 21.5 inches
- D. 22.0 inches



# Question #3

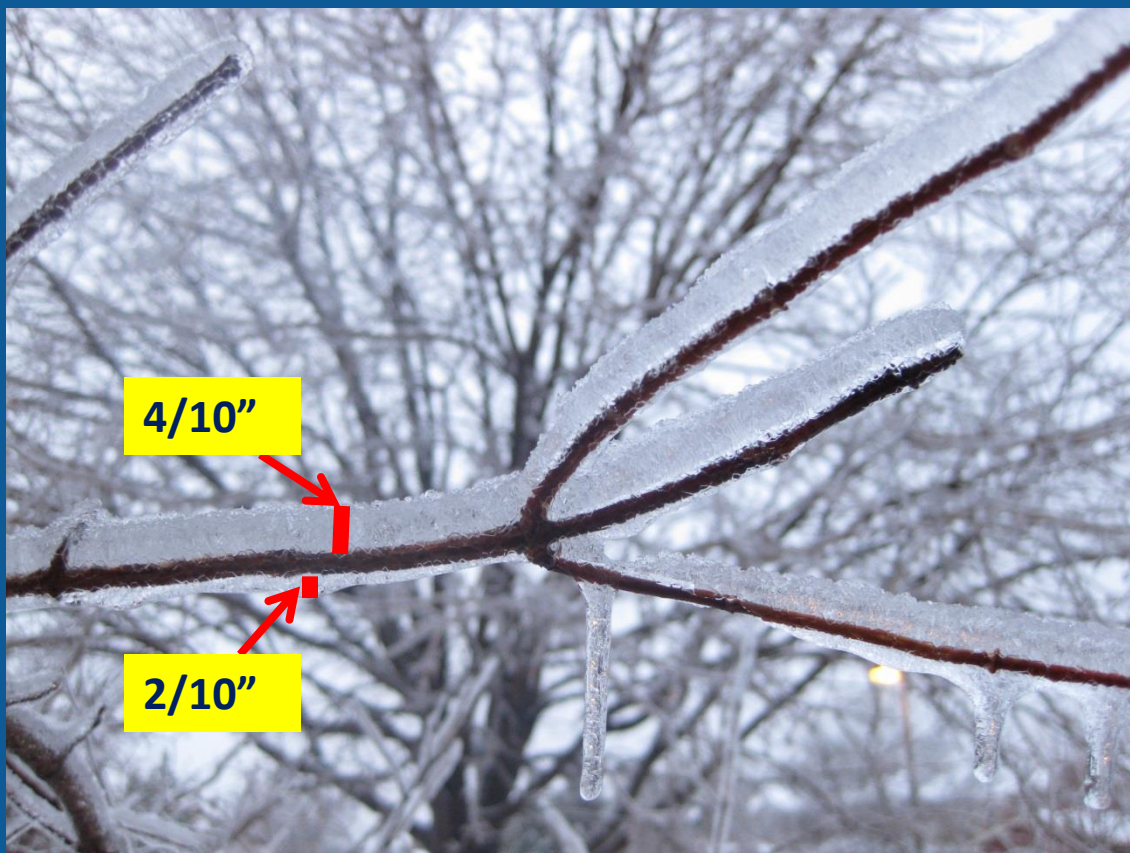
If you measure  $4/10''$  of ice on one side and  $2/10''$  of ice on the other side of the branch, your radial ice is...

A.  $6/10''$

B. 6.0"

C.  $3/10''$

D. 3.0"



To convert radial ice accumulation to a flat surface:  
 $0.3'' / 0.4'' = 0.75''$  of flat ice accumulation



# Question #4

**Which of the following is the correct and most helpful report listed below that will help us with ground truth?**

- A. "I received 4 inches of snow in the past 6 hours."
- B. "I received 4 inches of snow in the past 6 hours near the intersection of Main St. and Mountain Ave. in Albany, NY."**
- C. "I think some clouds moved over my house and gave us some snow"
- D. "Hooray! The Giants beat the Patriots in the super bowl again!"



# Question #5

Which of the following is an example of bomb cyclone (or bombogenesis)?

- A. Central barometric pressure in a low pressure system dropping 30 mb in 24 hours.
- B. Central barometric pressure in a low pressure system dropping 30 mb in 48 hours.
- C. Central barometric pressure in a low pressure system increasing 30 mb in 24 hours.
- D. When a tornado is associated with a Nor'easter.



# Skywarn Spotter Information Sheet



NATIONAL WEATHER SERVICE, NOAA  
ALBANY, NY  
SKYWARN INFORMATION SHEET



Report Severe Weather (Backup)	
Winter Weather Spotter Field Guide	<a href="https://www.weather.gov/media/safety/Winter_Storms2008.pdf">https://www.weather.gov/media/safety/Winter_Storms2008.pdf</a>
Email	<a href="mailto:alb.stormreport@noaa.gov">alb.stormreport@noaa.gov</a>
NWS Albany	<a href="http://www.weather.gov/Albany">www.weather.gov/Albany</a>
Twitter	<a href="https://twitter.com/NWSAlbany">@NWSAlbany</a>
Facebook Page	<a href="https://www.facebook.com/NWSAlbany">https://www.facebook.com/NWSAlbany</a>
NOAA Weather Radio	<a href="http://www.nws.noaa.gov/nwr">www.nws.noaa.gov/nwr</a>
Storm Prediction Center	<a href="http://www.spc.noaa.gov">www.spc.noaa.gov</a>
NWS Online Weather School	<a href="http://www.weather.gov/jetstream">www.weather.gov/jetstream</a>
Weather Prediction Center	<a href="http://wpc.ncep.noaa.gov">wpc.ncep.noaa.gov</a>
River Flood Monitoring	<a href="http://water.weather.gov/ahps">water.weather.gov/ahps</a>
CoCoRaHS	<a href="http://www.cocorahs.org">www.cocorahs.org</a>
NWS Amateur Radio Frequency	Primary 146.64 MHz - Secondary 145.19 MHz

## IMPORTANT WEATHER TO REPORT

When you report, please give your location (including your county) and the time of the observation. Try to report as soon as possible after observing the event and, *remember your safety comes first!* Please concentrate on the following phenomena:

<b>SNOWFALL</b>	After 1 inch of new snow, measurements every 6-hours and then final storm total at the conclusion of the event. In addition, note and report when precipitation type changes.
<b>FREEZING RAIN</b>	As soon as you observe the occurrence of freezing rain or freezing drizzle, especially if it starts to collect on objects. Call again if the ice accumulation exceeds 1/4 inch. (measure on flat surface)
<b>THUNDER SNOW</b>	Location and time of occurrence
<b>WIND SPEEDS</b>	Report wind speeds greater than 40 mph
<b>RAINFALL</b>	Report when you receive one inch (and then at least every inch thereafter)
<b>FUNNEL CLOUD</b>	A "rotating" appendage descending from the base of a cumulonimbus cloud, but not touching the ground. If possible, always look at the area beneath the funnel cloud for flying debris. If flying debris is observed, it is a tornado.
<b>TORNADO</b>	Violently rotating column of air descending from a cumulonimbus cloud and touching the ground. Look for flying debris. If possible, report any injuries or fatalities
<b>HAIL</b>	Report hail 0.75 or larger. Specify the diameter based on the hail scale.
<b>FLOODING</b>	Any flooding including streams out of their banks, water over road, water in basement or any ice jam flooding. Report deepest water depth (estimate if necessary).
<b>DAMAGE</b>	Report all storm-related damage (large branches, fallen trees, structural damage, flood damage, etc.) Even if it is several days after the event.

## TIME TO FROSTBITE



		Temperature (°F)																	
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-64	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-85	-92
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Freeze/thaw

no rain

wind

rain

Wind Chill (F) = 35.74 + 0.6215T - 35.75/(V<sup>0.16</sup>) + 0.4275T(V<sup>0.16</sup>)

Where: T is Air Temperature (°F) V is Wind Speed (mph)

Effective 1/10/10

Frostbite Times: 10 minutes, 20 minutes, 30 minutes, 40 minutes

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V<sup>0.16</sup>) + 0.4275T(V<sup>0.16</sup>)  
Where, T = Air Temperature (°F), V = Wind Speed (mph), Effective T = 10°C

## ESTIMATED WIND SCALE

25-31 MPH.....	Large branches in motion; whistling in telephone wires
32-38 MPH.....	Entire trees in motion; slight difficulty walking against wind
39-54 MPH.....	Twigs break off trees; wind generally impedes progress
55-72 MPH.....	Damage to chimneys and TV antenna; large limbs/branches down
73-112 MPH.....	Roof surfaces damaged; windows broken; light mobile homes moved or overturned; moving vehicles pushed off road
113-157 MPH.....	Roofs torn off; weak buildings and mobile homes destroyed
≥158 MPH.....	Severe damage; cars lifted completely off ground

## DEFINITIONS

<b>Hazardous Weather Outlook</b>	Hazardous winter weather conditions are possible in the next 2-5 days. Stay tuned to local media and NOAA Weather Radio All Hazards for updates.
<b>Watch</b>	Hazardous impact conditions are possible within the next 36-48 hours. Prepare now!
<b>Warning</b>	Life-threatening impact conditions have begun or will begin within 24 hours. Act Now!
<b>Advisory</b>	These events will be an inconvenience. However, if caution is not exercised, it could become life-threatening.
<b>Flooding</b>	Flooding typically occurs when prolonged rain falls over several days, when intense rain falls over a short period of time, or when an ice or debris jam causes a river or stream to overflow onto the surrounding area. Flooding can also result from the failure of a water levee or dam, as well. The most common cause of flooding is water due to rain and/or snowmelt that accumulates faster than soils can absorb it or rivers can carry it away. Flash floods generally develop within 6 hours of the immediate cause and exhibit a rapid rise of water over low-lying areas.
<b>Ice Jam</b>	Pieces of floating ice carried with a stream's current that accumulate and block the movement of water. The water that is held back may cause flooding or flash flooding upstream. If the jam suddenly breaks then flash flooding may occur downstream.
<b>Funnel Cloud</b>	Cold air funnels form beneath showers or weak thunderstorms when the air aloft is especially cold. They are much less violent than other types of tornadoes.
<b>Downburst</b>	A strong downdraft with an outrush of damaging wind on or near the ground <b>Macroburst</b> – swath of damaging wind more than 2.5 miles wide <b>Microburst</b> – swath of damaging wind 2.5 miles or less



# To Receive Your Certificate

Here is the certificate  
print out, if desired.

<https://www.weather.gov/warnCertificate.pdf>



Digital Online Signature

<https://goo.gl/forms/XPJh5X6A0jIw2I2t1>

options for you to

[warnCertificate.pdf](https://www.weather.gov/warnCertificate.pdf)



# Skywarn Weather Spotter Training

Alb.stormreport@noaa.gov

**Thank You!**



Skywarn™ Form (Optional)

<https://forms.gle/BV2oXayoLyPUB6yAA>



[www.weather.gov/albany](http://www.weather.gov/albany)



NWSAlbany



@NWSAlbany



NWSAlbany